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Maternity as a Public Health Problem

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Milk-Borne Septic Sore Throat

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Maternity as a Public Health Problem*

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BEFORE the advent of what is commonly called modern public health, health administration was comparatively simple; its field was narrow; and the duties and prerogatives of health officials were generally accepted without dispute, not only by the public but by the medical profession.

With the constant expansion of the field of public health, due to popular demand, unquestionably stimulated and rendered vocal and effective by the activities of official and nonofficial health agencies, the administration of public health is becoming increasingly difficult, largely because the borders of the field are continually impinging on the rights and prerogatives, real and fancied, of other official and non-official agencies. This leads to frequent disputes, bad feeling, lack of coöperation, working agreements, and all sorts of more or less futile compromises. Yet the health official, who seeks to limit his work to the quarantine and control of infectious diseases, the protection of water and food supplies, and such matters of routine as daily come to his attention, can hardly expect to keep abreast of the demands of modern life.

It is safe to say that the average health officer does not of his own volition seek to enlarge greatly the scope of his activity. Most of them would prefer to perform more efficiently the fundamental and essential work of their office with the production of more immediately measurable results than is usually possible in the majority of the newer fields; but the powers and responsibilities conferred by law upon health officers of larger jurisdictions are so far reaching and inescapable

* Presidential Address delivered before the State and Provincial Health Authorities of North America at the 44th Annual Conference at Washington, D. C., May 31, 1929.

that they cannot be avoided with self-respect and a sense of obligation to the oath of office.

Among the more recent activities in which health officers must engage may be mentioned the control of venereal disease, cancer, well baby clinics, periodic health examinations, and the reduction of maternal mortality. I have chosen the latter as a basis for some general observations—not that it is by any means the most important branch of public health, but because it presents a problem which includes possibly as many controversial elements as any of the others mentioned, and because no other phase of public health has produced more widespread discussion throughout the nation, or more heated arguments pro and con, than that of the care of the pregnant woman, involving as it does questions of federal and state financial policy, political expediency, personal prejudices, authority for the conduct of the work, and, most important of all, the control of methods of medical practice in the home and hospital.

Briefly stated, what is the problem which we as health officers are called upon to solve? In the 40 states and the District of Columbia, comprising the registration area for 1927, 13,837 women died from causes directly connected with childbirth. From a statistical standpoint, the figures themselves are not startling compared with those for the principal causes of death, but when the fact is taken into consideration that we are dealing not with a disease but with a physiological process, they are most disheartening, and a reproach to public health administration and its frequently vaunted claims of rapid progress in the achievement of definite results.

The deaths annually of 14,000 or 15,000 women from causes directly connected with childbirth, and the chronic invalidism of many times that number, constitute a much graver problem than an equal number of deaths among the general population or among infants and young children, since in a large number of cases the death of a woman in childbirth involves the disruption of a home, the future welfare of many dependent children, and other sociologic and economic factors, with which it is frequently very difficult to deal.

The definite recognition of maternal mortality as a public health problem in this country can be said to date from the enactment of the Sheppard-Towner Act, by which funds were made available to the states for work in maternity and child hygiene. Before that time little was done for the welfare of the expectant mother except in a few large cities and by unofficial organizations. During the last five years with greatly increased financial resources within the states, directly and indirectly as a result of the federal act, and an immensely aroused

public interest, especially among representative American women, the work has gone forward with a degree of success which is not easily estimated—certainly not statistically—and yet only the most prejudiced critic would dare to assert that no progress has been made toward the solution of what is and for a long time will be an extremely difficult problem.

As good Americans, we claim and frequently exercise the inalienable right to criticise and condemn our own shortcomings as a nation, and in this spirit most of us at one time or another in our moments of oratorical inspiration have called upon our audiences to witness the disgraceful neglect of expectant mothers prevailing throughout this country, resulting in a higher maternal death rate than in most of the civilized nations. This fact would seem to be proved statistically, and yet before permitting ourselves to indulge in too violent self-condemnation, let us be certain that the figures of other countries are as accurate as ours, and based on identical methods of allocating causes of deaths. Furthermore, those countries that show the lowest maternal death rate are very small in area compared with the United States, and contain a much more homogeneous population than that with which we have to deal. No nation, except ours, is called upon to face such a racial variation in fitness for motherhood. It can hardly be supposed that maternity work in certain states in the northwest is accountable for the low maternal mortality as compared with that of most other states; it is rather the physical development and habits of people of Scandinavian blood, among whom in their mother country the maternal death rate is exceedingly low, and, incidentally, lower than among the immigrants of that race and their descendants in this country.

In a recent pamphlet published by the Maternity Center Association of New York, N. Y., the problem with which we are confronted is summed up as follows:

> In the United States there are:
> 3,026,789 square miles of territory
> Whole communities without roads
> Wide stretches of territory without doctors
> 1,900 counties without a public health nurse (almost one-half of the counties in the United States)
> At any given time more than 2,000,000 pregnant mothers distributed over this vast territory.

Let me point out other inherent difficulties which we as health officers are facing, and will have to face for many years to come. I had hoped to present an analysis of the facts regarding some 3,000 maternal deaths in the State of New York, based on a questionnaire sent

out to all the physicians in the state in whose practice such deaths had occurred. Unfortunately tabulation of the results has proved much more time consuming than was at first anticipated. It may be of interest, however, to record the fact that more than 80 per cent of the physicians who were asked to fill in this confidential questionnaire responded promptly and fully—a splendid example of coöperation between the medical profession and public health authorities. The same kind of questionnaire sent to the various hospitals received far less consideration. A preliminary analysis of 696 replies received for the year 1925 brought out these facts among others:

Of the 696 cases, hospital care had been involved in 74 per cent, about half of which were delivered and died in the hospital, and the rest delivered in the home but died in the hospital later.

Only one-third of these cases reached full term; one-fifth were under 5 months gestation.

The lapse of time between the delivery and the death of the mother was as follows: In one-fifth of the cases death and delivery were practically simultaneous; in one-fourth there was a lapse of from 1 to 5 days between delivery and death; in one-fifth 6 to 14 days, and in one-eighth 16 to 50 days.

As to nationality—75 per cent were American born, 9 per cent Italians, and 4 per cent Poles.

Over 5 per cent were illegitimate births.

There were 230 questionnaires which stated at what stage the patient had entered the hospital. Only 13 per cent entered before delivery, 37 per cent during labor, and 50 per cent after delivery.

What chance did the doctors have as indicated by the number of days under care before death? To this question there were 483 replies. Fifty per cent had the case 1 week or less; over 10 per cent had the case less than 1 day; the balance were under care for varying periods, but only 13 cases were reported as having been carried the whole 9 months.

Only 16 cases were reported as having been delivered by a midwife, but others had a midwife in attendance at some time. A midwife was involved in 1 death, but was later exonerated.

As to prenatal care, 41 per cent failed to answer. Of the 408 answers, 65 per cent reported *Yes;* 35 per cent reported *No*. From the meager information as to the details of prenatal care, it was most difficult to gauge the effectiveness of such care. Judged by the generally accepted standards—the minimum standards as issued by the State Department of Health some five years ago—it would appear that few cases had enjoyed what might be termed adequate prenatal care. An attempt to ascertain when such care began showed that 34 per cent did not have prenatal supervision until the 7th, 8th or 9th month.

The most important fact to be derived from this analysis is that 74 per cent of these patients had been hospitalized, but that half of them had been delivered before going to the hospital, and later died therein. This represents a very high degree of emergency, with the

inevitable conclusion that the patients received little medical supervision until it was too late.

During the hearings on the Newton Bill before the Committee of Interstate and Foreign Commerce of the 70th Congress, the remarks of Dr. George W. Kosmak of New York were especially interesting. He represented, I believe, the state medical society, and is incidentally one of the dozen consulting obstetricians whose services the State Department of Health placed at the disposal of the county medical societies of the state by the use of federal funds. The object was the imparting by lectures and demonstrations to the general practitioners of the state an up-to-date knowledge of obstetrical procedures. Dr. Kosmak expressed the opinion that the work in maternal hygiene, as conducted in the various states under the provisions of the Sheppard-Towner Act, dealt too largely with what he regarded as the nonessentials of the problem, namely, prenatal care and instruction; that the question was largely one of obstetrical practice; and that failure to obtain more striking results in the diminution of maternal deaths was due in a large degree to bad obstetrical procedure. With the latter part of this statement I think most of us will agree; but that good prenatal and postnatal care cannot be characterized as a nonessential is adequately proved by the results which have followed well organized work in this field.

Through the courtesy of the Child Health Demonstration Committee of The Commonwealth Fund, I am permitted to call attention to the work of that organization in Clarke County, Ga., and Rutherford County, Tenn., from 1925 to 1928. This involves a group of some 5,000 women, approximately proportioned 2 to 1 as regards white and colored. Of these, 1,271 were under maternity care and 3,755 not under maternity care supervised by the health department. The maternal mortality per 1,000 live births in the combined group of white and colored, supervised and not supervised, was 9.4 (5.9 among the white, 16.4 among the colored); in the whole group not under official supervision 11.2 (6.9 among the white and 20.9 among the colored); under maternity care 3.9 for the whole group (2.6 among the white and 6.0 among the colored).

The cases under supervision in relation to maternal deaths include those visited by health department nurses for prenatal and, in most instances, for postnatal care. This is a striking example of what may be accomplished by thorough-going prenatal care, and presumably does not include supervision over the kind of obstetrical practice which these women received.

For what they are worth, data are submitted of the results among

approximately 1,000 expectant mothers attending the prenatal consultation clinics held by the New York State Department of Health during the past 5 years. By these it is shown that the mortality among mothers who visited these clinics was 14.6 per cent lower than the general puerperal mortality rate of the state, exclusive of the City of New York. The total number of deaths in this group was so small, however, that the figures in themselves cannot be regarded as of any great significance. Numerous other examples could be quoted of efficient and persistent prenatal and postnatal supervision which have produced definite results in lowering maternal mortality.

To return to the question of the practice of obstetrics as influencing maternal mortality—while undoubtedly the lives of a great many pregnant women are sacrificed annually in this country through the inaccessibility of medical care, or the entire lack of it, when the fact is considered that a large part of these deaths—certainly more than half—occur in cities and communities where doctors *are* available and *do* take charge of such cases, it is essential that the methods of obstetrical practice in this country be taken into account, however difficult it may be for health officers to ascertain the facts regarding them.

No one will question the oft-repeated statement, especially by members of the medical profession, that the teaching of obstetrics in most of our medical schools is totally inadequate. In many the instruction and experience afforded students is far less than that required of midwives in those states which supervise their work and license them. Indeed in some of our medical schools the faculties have not departed from the original conception that the practice of obstetrics is hardly a man's job, and can be mastered apparently by inspiration or after the observation of a few normal cases, in the actual delivery of which the student takes no part. The medical schools must then be held directly responsible for the kind of obstetricians which are being turned out in many parts of the country.

On the other hand, there has arisen of late years a school of meddlesome obstetrics founded on the practice and teaching of certain unquestionably skilled obstetricians, the popularity of whose practice is undoubtedly based on the very natural desire of women to be relieved in so far as possible of the sufferings of childbirth—even though among the more intelligent there must be knowledge of the additional risk to their lives and health, as well as to the children. These men have little or no regard for the processes of parturition which nature has perfected and which cannot be improved upon in a vast majority of cases. Yet some of them as a matter of routine resort to artificial methods of manual delivery; use instruments; and perform Cesarean

operations on the slightest provocation, or with none at all. I have had occasion to analyze the results of this kind of practice and, for one, am ready to state that in the broader sense it constitutes malpractice, even though it cannot be legally so adjudged.

As health officers, we are helpless to remedy this condition of affairs, and it is time that the organized medical profession should be empowered by law and stand ready to clean house in the interest of the lives and health of prospective mothers in this country. If they do not do so, the health authorities will be obliged to perform the task with a weapon, always at their command—pitiless publicity.

In the study that I have had prepared by the New York Division of Vital Statistics of death rates from specified puerperal causes in the original birth registration area from 1915 to 1925, omitting the years 1918, 1919 and 1920, which showed abnormally high rates owing to the prevalence of influenza, the following facts are elicited:

The death rate per 10,000 live births, due to accidents of pregnancy, increased on the average 2.4 per cent annually.

From puerperal hemorrhage 1.5 per cent.

Other accidents of labor 2.9 per cent.

Puerperal phlegmasia alba dolens, embolus, sudden death, 5.2 per cent, while deaths from puerperal albuminuria and convulsions decreased 2.0 per cent, and puerperal septicemia 0.9 per cent.

Incidentally, it may be stated that the mortality of infants from injuries at birth for the 10-year period 1915 to 1925 has risen on an average 3.6 per cent annually. If these figures mean anything—and they are based on a sufficiently large number of cases to be significant—they represent the results of meddlesome and unskillful obstetrical practice.

While progress is slow, the trend of maternal mortality in this country since the beginning of the campaign is definitely downward. The work of reducing maternal mortality differs widely from such procedures as immunizing the population against diphtheria; protecting a community against a water-borne outbreak of typhoid fever; or controlling infant mortality partly by means of the supervision of the milk supply. It is and always will be a more or less piecemeal affair. The cases are widely scattered throughout the country, and the conduct of a campaign must be based not only on general principles affecting the whole problem, but on racial peculiarities, and numerous other local conditions.

It is well to point out the fact that very little work is being done in the greater centers of population where, of all places, facilities should be at hand capable of producing definitely good results. It is

also of immense importance that knowledge should be forthcoming as to the kind of obstetrical practice afforded by hospitals of various types. Here again, the medical profession must assume the task in large measure. It will require independence, unselfishness, and a much greater indifference to that much abused term "medical ethics" than has hitherto prevailed. The work of public health education in regard to maternity must go on and be more effectively developed. Notwithstanding the criticisms to which it is constantly subjected it has produced and will continue to produce far-reaching results.

Many years ago Dr. Abram Jacobi of New York delivered an address in classic Latin before the Roman Medical Congress. If I remember correctly, he deprecated the then growing tendency to perform operations on the brain for the relief or cure of various pathological conditions. The title of his paper was "*Non Nocete*" (Do no Harm), an admonition which those who are responsible for the care of the expectant mother may well take to heart.

Tolerance

THERE is a limit beyond which abuse, misstatement, intolerance, and destructiveness must not be allowed to go. I hold no special brief for the medical profession. I realise that doctors, like the rest of us, have their failings. I am aware that privilege and vested interest may make some of them—sometimes—as selfish and intolerant as any. I tell them this at intervals, and admit, as greatly to their credit, that in spite of my abuse they continue to treat me with great friendliness and consideration; perhaps they do not take it too seriously.

Gratitude, however, for that friendliness is not the reason why I stand here today to defend them and their colleagues in the laboratories. Rather is it a sense of urgent necessity. When the beneficent work of the Medical Research Council is publicly denounced by a presumably responsible priest, when the use of radium in the treatment of cancer, is openly described as an imposture by a qualified medical man who claims to have investigated it, and found it worthless forty years ago (9 years before it was discovered!), when the public is implored not to subscribe to hospitals lest its money be spent in torturing rabbits and guinea-pigs, when the greatest of human quests—the search for knowledge for the alleviation of suffering—is held up to obloquy by persons incapable of understanding or appreciating the beginning of what it means, then it is time for a counter-attack to be made.

. . . I do not propose, however, today to discuss only the fantastic opposition of the antivivisectionists. Their attitude of mind is only one aspect of a general phenomenon well known throughout history, a mild form of mental disorder, if you will, but one which has expressed itself from time to time in various hideous forms: in cruelty and persecution, in hatred and malice, in the perpetual treachery of hindering mankind in his slow and pathetic efforts to climb the ladder of civilisation.—A. V. Hill. From *The Lancet*, June 29, 1929, p. 1385.

Precision and Reliability of Underweight Measurement

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THERE are two reasons for weighing school children. The first is the educational purpose of interesting the child in growing. It rests upon the realization that growth is a natural and continuous process and that the growth rate of children with good health and hygienic practices is better than that of children who are sick or who live unhygienically. The second reason for weighing school children has been to determine, in some degree, their health status by examining their height-weight ratio.

We are here concerned with the latter procedure, but it is desirable to point out at the beginning that the first or educational procedure is entirely separate from the second. It furnishes one of the best child incentives in the health education program and would continue to be useful even if the height-weight ratio as an index of health should be abandoned.

Can we assume that a child who is 10 per cent or 7 per cent below average weight for height and age is subnormal in nutrition or in health?

Can and should all children be brought out of this underweight group?

Can the effectiveness of a school health program be measured by the reduction in the number of underweight children?

These are important questions in determining certain phases of school health procedure. An examination of the nature and precision of the underweight measurement will help to answer them.

Children of the same height and age vary in weight for two reasons. The first is a difference in heredity, in nature, in skeletal proportions. The second is a difference in the amount of flesh, in nurture, a tendency toward emaciation or obesity—abnormal variations which are related to health or nutritional status. The presumption in the diagnostic use of underweight is that the underweight child has fallen below those variations which could be produced by the first

cause, and, therefore, must have something wrong with his health or nutrition.

AVERAGE WEIGHT—HOW ARE TABLES MADE?

Many standard weight tables have been made and an examination of these will show that each indicates a different average weight for boys or girls at each particular age. For example, 36 different tables give 33 different figures, ranging from 29 to 34.4 kg. as the average weight for boys 11 years old. In other words, when sets of tables are made the makers do not arrive at the same average weights.

We shall consider here the Baldwin-Wood tables. They were made from measurements of supposedly healthy children.* The process of making the tables includes, first, the weighing of many children without clothing and the determination of the average weight for each age-height group. A reasonable weight is then added for clothing and the resulting "average weight" is stated in terms of the nearest whole pound. (School people would do well to use the term "average weight" instead of "normal weight" whenever they refer to this figure because it is the average weight of a group of healthy children and does not indicate the weight which would be "normal" or "most desirable" for any particular child.)

Dr. Baldwin was good enough to send me some of the basic data from which his tables were made. Table I shows the number of children used in each computation. Table II shows the mean weights found for three age groups (7, 11, and 15 years) and the average deviations from these means. It will be seen, for example, that the average 11-year old boy varies from 2.6 to 10.2 lb. on one side or the other of the figure in the table according to the height group to which he belongs. Expressing such figures in terms of a percentage of the average weights we find that the average healthy 7-year old child varies from the mean by about 6 per cent, the 11-year old child by about 8 per cent, and the 15-year old child by nearly 10 per cent. Girls vary more than boys.

It seems apparent that a 7 per cent drop in weight below this average should not be considered as an indication of malnutrition since many supposedly healthy children show a variation as great as that. To be sure, some of these vary above the line, but an appreciable number in the Baldwin-Wood measurements must have been more than 7 per cent below the average weight. Variation in weight increases with age and one must expect to find many more 10 per cent underweight children among those 15 years old than among those 7 years old.

* No objective tests of health status were used in selecting the children measured.

We find, then, that the table does not indicate what a particular child should weigh, but an average weight from which healthy children vary rather widely.

In computing a child's relationship to average weight, his age to the nearest year and his height to the nearest inch are taken. One then looks up the average weight for the sex, age, and height as recorded in the table. The child's actual weight to the nearest pound is then divided by this figure and we say he is such a per cent of average weight. Whole units are used and this reduces precision.

The Age Factor—Ordinarily age is taken to the nearest birthday. Suppose a child is 10 years and 5½ months old on January 1; on February 1 he is 10 years and 6½ months. For purposes of computation his age has increased 1 year; actually it has increased 1 month. In schools where age as of a particular day in the calendar year is used, all children are underaged or overaged at particular weighing periods.

What difference will underaging or overaging make in the "per cent of average weight"? That may be determined for any particular case by referring to the Baldwin-Wood tables. The effect of underaging or overaging children under 8 years of age is slight, but after that time the number of children affected increases, and after 13 years

TABLE I

DISTRIBUTION OF CASES USED IN BALDWIN-WOOD WEIGHT-HEIGHT-AGE TABLES

Boys

Height Inches	Age, Years 6	7	8	9	10	11	12	13	14	15	16	17	18
40.5–41.4	2												
41.5–42.4	4	1											
42.5–43.4	14	6											
43.5–44.4	28	7	2										
44.5–45.4	35	25	8	3									
45.5–46.4	45	47	12	6									
46.5–47.4	50	55	27	7	2								
47.5–48.4	17	86	75	22	10								
48.5–49.4	16	71	78	41	17	5							
49.5–50.4	3	48	110	80	37	7	3						
50.5–51.4	2	28	97	104	75	28	9	2	1				
51.5–52.4	2	12	72	143	115	55	19	2		1			
52.5–53.4		4	39	120	161	102	38	11	1				
53.5–54.4			23	100	170	154	64	27	5		1		
54.5–55.4		1	14	59	154	186	108	45	12	2			
55.5–56.4			4	38	116	211	175	65	23	1			
56.5–57.4			1	15	82	157	190	127	45	10	1		
57.5–58.4				9	43	125	203	165	64	22	2		
58.5–59.4				2	18	87	157	167	85	23	2		
59.5–60.4				1	11	49	121	172	130	56	13	1	
60.5–61.4					3	23	89	159	129	61	19	7	1
61.5–62.4					1	15	41	126	132	80	36	9	7
62.5–63.4						3	29	82	148	100	29	9	4
63.5–64.4						2	10	74	134	107	55	23	5
64.5–65.4							4	31	98	133	86	38	16
65.5–66.4							3	26	69	124	122	56	23
66.5–67.4							1	6	48	106	99	90	47
67.5–68.4								4	41	76	126	96	42
68.5–69.4								3	16	55	91	74	42
69.5–70.4								1	7	35	53	57	42
70.5–71.4									5	19	36	22	15
71.5–72.4										3	18	24	16
72.5–73.4									1	2	13	10	13
73.5–74.4									1	1	3	4	3
74.5–75.4												2	
Total No.	218	391	562	750	1,015	1,209	1,264	1,295	1,195	1,017	805	522	276

of age a change of 1 year in age would affect the "percentage normal" weight of the majority of children.

We have taken the trouble to compute the effect upon the "percentage normal" weight produced by overaging and underaging 1 year for boys and for girls at different age levels. Table III shows the maximum and minimum change in per cent from overaging 1 year at each age level. It may be as little as 0.75 per cent, or as much as 5.7 per cent. This tells us also the change which would be made in the percentage normal weight of a child who is given credit for being a year older when actually he is only a few weeks older. In other words, a child may become as much as 4 per cent or 5 per cent more underweight the day he becomes a year older. All children are not equally affected and Table III has, in the last column, a statement of the extent to which a whole population of children would be made underweight if they were overaged 1 year.

The Height Factor—What about changes in height? We use height to the nearest inch in computing the child's percentage of average weight. One often finds a child half way between the inch marks and wonders whether he should indicate the child's height as the lower inch or the higher inch in making the computation. How much difference does it make? What happens to a child's underweight status when he gains ¼ inch and gets credit for gaining a whole inch? By making sample computations from the Baldwin-Wood table it is found

TABLE I (*Con.*)

DISTRIBUTION OF CASES USED IN BALDWIN-WOOD WEIGHT-HEIGHT-AGE TABLES

Girls

Height Inches	Age, Years												
	6	7	8	9	10	11	12	13	14	15	16	17	18
40.5–41.4	3	1											
41.5–42.4	17	1											
42.5–43.4	31	11											
43.5–44.4	49	14	1										
44.5–45.4	60	43	15										
45.5–46.4	60	91	27	6		1							
46.5–47.4	43	102	68	16	1								
47.5–48.4	18	92	104	48	10		1						
48.5–49.4	14	63	122	86	24	1		1					
49.5–50.4	2	40	142	128	72	15	1	2					
50.5–51.4		26	102	169	100	33	4		1				
51.5–52.4		9	59	155	164	78	20	2					
52.5–53.4		2	41	139	204	120	23	2	3				
53.5–54.4		2	22	85	181	163	74	10	2	2			
54.5–55.4			2	58	180	219	112	23	2	1			
55.5–56.4			2	37	104	202	139	58	2		3		
56.5–57.4				6	67	144	193	90	22	2	3	1	2
57.5–58.4				3	37	144	186	110	46	13	1	1	2
58.5–59.4					16	90	155	135	74	25	12	7	1
59.5–60.4					3	66	160	214	140	77	33	23	7
60.5–61.4					1	37	131	208	175	154	94	50	25
61.5–62.4						9	83	198	225	176	148	91	56
62.5–63.4						5	53	140	215	214	178	125	59
63.5–64.4							15	84	168	177	175	136	57
64.5–65.4							8	62	115	136	127	94	55
65.5–66.4							3	26	66	83	80	85	35
66.5–67.4								8	32	45	64	51	20
67.5–68.4									14	19	20	23	14
68.5–69.4									2	12	13	10	6
69.5–70.4										2	4	4	2
Total No.	297	497	707	936	1,164	1,327	1,361	1,373	1,304	1,138	955	701	341

TABLE II

MEAN DEVIATION BASED ON MEASUREMENTS USED IN WEIGHT-HEIGHT-AGE TABLES

Boys

7 Years					11 Years					15 Years				
Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %	Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %	Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %
44	7	44	2.4	−5	51	28	61	2.6	4	58	22	87	10.3	12
45	25	46	2.2	−5	52	55	64	5.2	8	59	23	90	4.3	5
46	47	48	2.4	5	53	102	67	4.3	6	60	56	95	8.1	9
47	55	50	2.5	5	54	154	70	4.8	7	61	61	100	7.5	8
48	86	53	3.0	6	55	186	73	5.6	8	62	80	104	8.3	8
49	70	55	3.6	7	56	211	77	6.0	8	63	100	110	8.8	8
50	48	58	2.9	5	57	157	81	7.4	9	64	107	110	9.2	8
51	28	61	6.2	10	58	125	84	7.7	9	65	133	120	8.8	7
52	12	63	4.2	7	59	87	88	7.9	9	66	124	125	10.1	8
					60	49	92	9.0	10	67	106	130	9.5	7
					61	23	95	10.2	11	68	75	134	8.6	6
										69	55	139	8.6	6
										70	35	144	13.8	10
										71	19	150	8.8	6

Girls

43	11	41	2.9	7	50	15	61	3.3	5	58	13	96	10.2	11
44	14	42	2.5	6	51	31	63	6.3	10	59	24	100	11.5	12
45	43	45	3.6	8	52	76	65	4.4	7	60	76	105	10.8	10
46	89	47	2.6	6	53	120	68	5.6	8	61	154	108	11.3	10
47	101	50	3.1	6	54	161	71	7.1	10	62	176	113	11.5	10
48	92	52	3.8	7	55	212	74	6.6	9	63	212	116	11.0	9
49	58	54	4.1	8	56	199	78	8.2	10	64	175	119	11.9	10
50	43	56	2.8	5	57	166	82	7.2	9	65	140	122	11.9	10
51	25	59	3.2	5	58	142	86	9.9	12	66	83	125	15.9	13
52	9	63	5.0	8	59	90	90	10.5	12	67	45	131	14.4	11
					60	66	95	9.7	10	68	19	135	12.8	9
					61	35	99	9.9	10					

that an added inch in height increases the extent of underweight by about 4 per cent. The use of whole inches may make an underweight figure inaccurate to this extent.

The Weight Factor—Weight is usually computed to the nearest quarter pound, but used as the nearest whole pound in making the com-

TABLE III

EFFECT OF OVERAGING GIRLS ONE YEAR

Age	% of Girls of this Age at Heights (Burke) which Show Variation in Weight from One Year Older (Baldwin-Wood)	Minimum Change in % Underweight of Any Girl	Maximum Change in % Underweight of Any Girl	% Underweight Change of All Girls
5	0.1	2.00	2.00	0.002
6	0.0	0.00	0.00	0.000
7	18.0	1.49	2.08	0.360
8	9.7	1.43	2.70	0.165
9	55.9	1.47	2.56	1.004
10	56.5	1.41	4.20	1.281
11	72.0	0.95	3.08	1.477
12	83.5	0.87	2.82	1.993
13	89.6	0.83	5.38	3.189
14	89.8	0.76	4.35	3.067
15	94.3	0.73	4.94	2.119
16	91.6	0.78	1.71	1.225
17	84.6	0.69	2.57	0.998

EFFECT OF OVERAGING BOYS ONE YEAR

Age	% of Boys of this Age at Heights (Burke) which Show Variation in Weight from One Year Older (Baldwin-Wood)	Minimum Change in % Underweight of Any Boy	Maximum Change in % Underweight of Any Boy	% Underweight Change of All Boys
5	0.5	2.00	2.00	0.010
6	3.4	1.72	1.89	0.063
7	0.5	1.49	1.56	0.008
8	0.1	1.31	1.31	0.001
9	1.9	1.19	1.37	0.025
10	1.1	1.09	1.23	0.014
11	40.1	0.94	1.47	0.556
12	32.3	0.93	2.56	0.399
13	58.7	0.93	3.12	0.733
14	62.6	0.70	2.50	0.959
15	72.0	0.66	2.98	1.668
16	89.1	0.64	4.25	2.653
17	95.2	1.18	4.30	2.567
18	94.2	0.58	3.15	2.512

putation. Suppose you have a child just on the border line between one pound and another. If you choose the lower pound for your computation, he will be nearer up to weight than if you choose the upper pound, and the extent of the change in "percentage normal" weight will be represented by the fraction $\frac{1}{\text{the average weight}}$ which will usually amount to 2 per cent for younger children and 1 per cent for older children.

Combination of Factors—It is easy to secure from our data instances in which the whole units have combined either for or against an individual child. For example, one boy in January, 1921, was 100 per cent of average weight, or exactly normal. He grew at the expected or average rate in both height and weight, but because he slipped over certain whole units of computation though not over others, in January, 1922, he was found to be 94.3 per cent, or 5.7 per cent below average weight.

In another instance a girl who, in June, 1921, was 89.1 per cent of normal weight or nearly 11 per cent underweight, grew in both height and weight at the normal rate. Because of the accident of computation she was 96.8 per cent, or only 3.2 per cent underweight in April, 1922, and if we had used her height for a previous month, as is done in some schools, she would have been exactly normal weight although her body proportions could not have changed appreciably since her rate of growth in both weight and height was average. These differences arise because of the crudity of the measure.

Group averages of "per cent normal weight" are more consistent than individual figures, and yet if the individual determinations are crude so that they jump up and down from month to month, then obviously the averages are less significant because the individual variations are wide.

Shoes—Another factor which enters into the statistics issued by different school departments is that of shoes. In some schools children are weighed and measured with shoes; in other schools they are weighed and measured without shoes. We took the trouble to weigh 1,000 children* with shoes and without shoes, and Tables IV and V indicate the maximum, minimum, and average changes found.

For most children the percentage of average weight is greater when weighed and measured without shoes. That is, children in shoes are really like children on stilts. They seem taller and thinner. An inch of shoe does not weigh as much as an inch of boy. Therefore, the computation of the boy's relationship to normal weight shows him to

* Thanks are due to supervisors and teachers in Malden and Newton for making this possible.

TABLE IV

RELATION OF INDIVIDUALS TO "NORMAL WEIGHT" WITH AND WITHOUT SHOES

Age	No. in Group	Maximum Increase in % Normal when Shoes Are Removed	Maximum Decrease in % Normal when Shoes Are Removed	Children Showing No Change in % Normal	
				No.	% of Group
			Boys		
6	62	8	4	1	1.7
7	59	6	2	8	13.6
8	58	7	4	3	5.0
9	42	5	3	1	2.5
10	63	7	3	4	6.3
11	58	8	3	1	1.6
12	47	8	3	1	2.1
13	42	8	3	2	2.5
14	54	10	3	1	1.8
15	46	7	2	0	0.0
			Girls		
6	51	8	2	8	15.7
7	46	4	3	7	15.2
8	33	7	2	1	3.0
9	49	8	5	3	6.3
10	66	11	2	3	4.6
11	49	8	2	4	8.9
12	49	12	4	0	0.0
13	63	9	2	3	4.7
14	47	9	1	0	0.0
15	51	10	5	3	6.0

be "skinnier" in shoes than without shoes. That is not true in every case because sometimes the child, when he takes off his shoes, falls below the next pound level but not below the next inch level. He, therefore, is computed as being of less weight but the same height, in which case, of course, he seems to be more underweight with his shoes off.

Table IV gives the maximum increase and the maximum decrease in the per cent of average weight for both boys and girls at various ages. The maximum increase for the older boys and girls runs as high as 12 per cent. That is, some children were changed 12 per cent in their relation to average weight when weighed without their shoes. This is partly because of the accident arising from using whole pounds and whole inches.

The average effect of removing shoes is shown in Table V for boys, for girls, and for the combined groups. It raises the average "percentage normal weight" about 2 per cent and decreases the size of the 10 per cent underweight group by one-fourth to one-half.

POPULATION CHANGES IN UNDERWEIGHT STATUS

In our Malden Studies a significant increase was found in the rate of growth for the group of children who improved their habits. We did not find a statistically significant change in the average "percentage of normal weight." In the latter computation the slight improvement was less than the probable error. Similarly we found no significant change in the number of children who were in the 10 per cent underweight group. We were, of course, very careful to avoid any change in the method of computing the per cent underweight. We

always used the Wood tables, age to the nearest birthday, and height taken at the same time as weight with shoes on.

A few children did come out of the underweight group and reach average weight. These were children who were thin because of poor health or poor nutrition and who made definite improvement in their health. Frequently, however, we noticed improvement in health as shown by color, alertness, and greater freedom from fatigue when there was no appreciable change in the body proportions. The most frequent changes in the number of children in the underweight group arose among those children who were near the 90 per cent figure and who were thrown into the underweight group or out of it by the crudity of the computations already discussed.

Different communities present widely divergent figures concerning the number of 10 per cent underweight children in their school population. Many school systems which started weighing and measuring with the children's shoes on now have the shoes removed, and a still greater number of schools have changed from the Wood tables to the Baldwin-Wood tables. Height is usually taken only two or three times a year and many schools follow the unscientific practice of using the height for the last measurement in computing underweight during the succeeding months when new weights are secured. In a few instances one age is used for the child throughout the year, and this results in the underaging and overaging process with the effect upon underweight data which has been pointed out.

The Malden Studies showed no significant change in the underweight figures when the same technic of measurement and computa-

TABLE V

AVERAGE PER CENT NORMAL

	Boys					*Girls*			
Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase	Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase
6	62	99.8	101.1	1.3	6	51	98.8	100.0	1.2
7	59	98.8	100.1	1.3	7	46	99.0	100.1	1.1
8	58	99.1	100.9	1.8	8	33	99.2	101.2	2.0
9	42	98.1	100.3	2.2	9	49	97.7	99.9	2.2
10	63	100.6	102.3	1.7	10	66	97.2	100.1	2.9
11	58	101.1	103.2	2.1	11	49	95.1	97.8	2.7
12	47	100.2	102.2	2.0	12	49	100.4	103.3	2.9
13	42	98.7	101.4	2.7	13	63	99.2	100.7	1.5
14	54	101.9	104.4	2.5	14	47	96.7	100.1	3.4
15	46	99.5	101.4	1.9	15	51	96.5	99.7	3.2

AVERAGE PER CENT NORMAL BOYS AND GIRLS

Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase
6	113	99.3	100.5	1.2
7	105	98.9	100.1	1.2
8	91	91.15	101.05	1.9
9	91	97.9	100.1	2.2
10	129	98.9	101.2	2.3
11	107	98.1	100.5	2.4
12	96	100.3	102.7	2.4
13	105	98.95	101.55	2.6
14	101	99.3	102.25	2.9
15	107	98.0	100.55	2.5

tion was carefully followed. How extensive would be the changes resulting from modifications in the methods of determining which children are in the underweight group? In order to answer this question we made 5 separate computations for the group of 10 per cent underweight children in the Malden Studies in February, 1922. Table VI shows the results of these measurements.

TABLE VI

PERCENTAGES OF CHILDREN IN THE 10 PER CENT UNDERWEIGHT GROUP WITH CHANGES IN THE METHOD OF COMPUTATION

March, 1922

239 Boys and 236 Girls

Method of Computation	Per Cent in Underweight Group		
	Boys	Girls	All
Wood Tables, March Age, March Height, With Shoes	20.9	29.6	25.3
Baldwin-Wood Tables, March Age, March Height, With Shoes	11.7	28.4	20.0
Baldwin-Wood Tables, October Age, March Height, With Shoes	10.9	26.7	18.7
Baldwin-Wood Tables, October Age, October Height, With Shoes	4.2	16.5	10.3
Baldwin-Wood Tables, October Age, October Height, Without Shoes	2.1	7.6	4.8

Using the technic which we followed throughout our experiment, 25.3 per cent of the 475 children under observation were in the 10 per cent underweight group. In changing to the Baldwin-Wood tables the size of the underweight group is reduced to 20 per cent. If we use October age, the figure is 18.7 per cent. If we use October height, it is 10.3 per cent. In taking off the shoes for the group (with changes indicated in Table V for the respective ages) the size of the underweight group was further reduced by 50 per cent. In brief, with one method of computation 25.3 per cent of the children were 10 per cent underweight. Making four changes in the method of computation only 4.8 per cent of the group were 10 per cent underweight.

SUMMARY

Height-weight-age tables show the *average* weight for children by height-age groups and do not show the ideal weight for any particular child.

There is a distinct difference in the standards set by the different standard weight tables.

The average variation from the mean for the supposedly healthy children used in the preparation of the Baldwin-Wood tables was approximately 6 per cent for 7-year old children, 8 per cent for 11-year old children, and 10 per cent for 15-year old children.

The computation of a child's "percentage of average weight" is inexact because of using weight to the nearest pound, height to the nearest inch, and age to the nearest year. In unusual cases a child may vary 7 per cent in relation to average weight because of the crudity of the computations and without any change in his bodily proportions. Fluctuations of 3 per cent or 4 per cent from this cause are not uncommon.

Wide fluctuations because of the crudity of individual computations are reflected in the average status of small groups and lost in the averages for large groups.

Inexactness, lack of reliability, and wide fluctuations in individual computations make the demonstration of minor changes in underweight status for a group of children uncertain, difficult and unreliable.

Children drop in and out of the underweight group without changing body proportions because of the inaccuracy of the computation. These facts supplement and further explain the previously published data from the Malden Studies[1] and provide a means of rationalizing these data with divergent data on underweight status from other sources.

The Baldwin-Wood tables show fewer underweights in a school population than did the Wood tables.

The increase in natural variability with advancing age produces an increasing number of 10 per cent underweight children in each higher grade when the health status is the same.

The removal of shoes in weighing and measuring may make an individual child more underweight or less underweight, but on the average it brings children from 2 per cent to 2½ per cent higher, and reduces the size of the 10 per cent underweight group by one-fourth to one-half.

Changes in the methods of collecting data or in the method of computation (such as removing shoes, changing tables, the method of taking height and the method of aging) constitute "balanced errors" which, singly or in combination, have a distinct and definite effect upon the underweight figures.

CONCLUSIONS

The schools should realize more clearly that standard weight tables give average weight, not normal weight, that there is a normal variation, and that some children must be below the average.

It is unscientific and unfair to set average weight as a goal for all children.

The 10 per cent underweight standard does not apply with the same significance to all age levels. The school should expect a greater number of 10 per cent underweight children in the later age groups due to the increased natural variability.

Since the natural variability of girls is greater than that of boys one must expect more underweight individuals among the former.

Seven per cent underweight is so close to the variation from the mean of average healthy children that it would seem to be unsuited for screening purposes. It may be that the 10 per cent underweight limit should be changed for older children.

The separation of 10 per cent underweight children is a rough screening. We should further divide this group by separating those children who are underweight because of slender build from those who are underweight because of emaciation, general ill-health or malnutrition. The public school should use its medical staff to make this separation. Further anthropometric tests should be developed and used as an aid in separating these two groups.

The school should not give up the regular weighing of children as an educational means of interesting them in health and in health practices. Emphasis should be placed upon gaining in weight each month and not upon the child's underweight status. The making of weight graphs and other classroom procedures should recognize this principle.

The failure to gain in weight over a period of several months is abnormal. Further studies should be made upon the consistency of gain in order to determine more accurately its value as an index of health. The practice in school administra-

tion which brings to the attention of teacher, nurse, or doctor the child who fails to gain in weight over a period of 3 months would seem to be commendatory.

Regular gain in weight month by month should assist in relieving anxiety concerning the health of an underweight child.

The percentage of 10 per cent underweight children in two communities cannot be compared unless the method of gathering data and the method of computation are known to be the same.

Communities weighing and measuring children without shoes will have only half or three-fourths as many 10 per cent underweight children as communities weighing and measuring with shoes.

A reduction in the size of the 10 per cent underweight group in a school population has no significance unless it is known that there have been no changes in the method of gathering and computing data.

Changes in the size of the 10 per cent underweight group do not constitute a reliable measure for the success of a school health program.

In the hands of the physician underweight is one of the valuable diagnostic factors. The separation of underweights in a school population for further medical attention may be a valuable screening process. That underweight in itself does not constitute a complete diagnosis is now becoming more widely recognized by the lay public. It would be extremely unfortunate if the data presented above were used to discredit either the scientific medical use of underweight or the practice of weighing children regularly in school as an educational procedure.

REFERENCE

1. Turner, C. E. Malden Studies on Health Education and Growth, *A. J. P. H.*, 18, 10: 1217 (Oct.), 1928.

Contagiousness of Leprosy

IN a group of 100 Louisiana lepers hospitalized more than 15 years ago, it has been disclosed from subsequent records that in 64 instances only one leper in the family developed the disease, while in the 36 other instances leprosy occurred in 83 additional relatives. There were 14 instances in which the disease occurred in a mother and one or more of her children; 15 instances in which the disease was found in sons of lepers; 21 instances in which the disease was found in daughters of lepers; 38 instances in which the disease was found among brothers and 31 instances in which the disease was found among sisters. In addition the following number of cases occurred in less closely related members of the family: 8 uncles, 8 aunts, 18 nephews, 9 nieces, 5 grandfathers, 3 grandmothers, 6 grandsons and 5 granddaughters. In some families the disease has invaded certain branches to the point of extermination.

Instances of the occurrence of leprosy in families have also been noted in cases from other states than Louisiana. It has not invariably happened that the parent became infected before the child; indeed, the reverse frequently occurred. Intimate contact for many years was common where there was more than one case of leprosy in a family. In many instances several contacts with leprosy also existed. In 5 cases the incubation period is calculated as not less than 6 years.

Antirabic Immunization with Desiccated Vaccine

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DESICCATED rabies vaccine has been used since 1912 for the immunization of men and dogs. The results and data are now reported, to permit a critical comparison of the value of this with other methods employed by various investigators in this country and elsewhere.

Shackell and Harris[1] found that if rabies vaccine were frozen to — 10° C. and then dried in vacuo over sulphuric acid, about 2 per cent of the infectivity could be preserved for several months. Harris,[2] continuing this work, showed that the proportion of virus remaining alive after desiccation depends entirely upon the degree to which the material is frozen. Fixed virus, frozen with liquid air and then dried, retains 90 per cent of its infectivity. When frozen with CO_2 snow and dried in vacuo over sulphuric acid in a jar which is kept at a temperature of — 15° C., the resulting product retains more than 50 per cent of its original infectivity.

In the original method the brain and cord was mixed with CO_2 snow and ground in a mortar. This resulted in frequent bacterial contamination, to avoid which a jacket was welded around a steel mortar, leaving a space between the walls. The CO_2 is now passed into and through this enclosed space, and the mortar is chilled without direct contact of the brain with the snow. In all other respects the preparation is carried on as heretofore described in detail.

Repeated experiments showed that subdural injections of 0.004 mg. of this desiccated material would regularly infect rabbits with the usual incubation period. It was further established that the subsequent rate of loss of infectivity depends upon the temperature at which the product is stored. When kept at — 1° C. the material has been found to be infectious for at least 3 years. One lot, dried and sealed in vacuo October 19, 1920, produced typical symptoms in 2 rabbits inoculated on October 27, 1923.

In a series of experimental inoculations to determine the rate of loss of infectivity I found that those rabbits which were injected with a quantity too small to infect acquired an immunity against a subse-

quent injection of a lethal dose of fresh virus. Since publication,[2] these results have been repeatedly confirmed, and the fact has been established that rabbits injected subdurally with non-infectious desiccated vaccine can later withstand a subdural inoculation of several hundred lethal doses of fresh virus.

In other words, the virus which after long preservation in vacuo becomes non-infectious, still possesses immunizing value. This, however, slowly diminishes and after a time disappears completely. The lot described above which was proved to be infectious 3 years after its preparation was found to have lost all its immunizing property 5 years later (1928).

In 1917, owing to a frequent bacterial contamination of the brain which was thought to be due to the trephine wound, I began to inoculate rabbits by inserting the needle through the optic foramen. Whether due to this procedure, or to the long preservation of the virus in the cold, or to some unknown factor, it was found in 1918 that many rabbits failed to develop the disease when inoculated with virus which had been kept in vacuo for longer than 3 months. This resistance to desiccation gradually lessened, so that in 1920 all infectivity of the vaccine disappeared after storage in vacuo for 2 months, without, however, any impairment of its immunizing properties, as shown by repeated tests on rabbits.

This rapid loss of infectivity necessitated a complete change in the original method of immunization, which consisted in the injection of increasing quantities of vaccine somewhat similar to the method of Högyes.

Having in mind Pasteur's theory that the injection of non-infectious cord protects against the subsequent injection of virulent cord, and that this in turn produces a degree of immunity sufficiently high to protect against the danger due to the bite of a rabid animal, I changed my scheme of treatment, giving 5 daily doses, 25 mg. each, of non-infectious vaccine of the old strain (A), and followed these, in ordinary cases, with 5 similar injections of a new and resistant strain (B) partly attenuated by preservation in vacuo for 3 months. This fresh strain secured from William H. Park, M.D., of New York, N. Y., was tested and found, as already noted, to remain infectious in vacuo for at least 3 years.

During the past 8 years, immunization has been based on this plan, and experience has shown it to be adequate for superficial bites. This last strain (B) has as yet shown no altered resistance as the result of repeated desiccation.

In the treatment of persons severely bitten on the hand the usual

course consists of 5 injections of the old strain (A), and 8 to 10 injections, of 25 to 35 mg. each, of the new (B), depending upon the extent of the bite and the number of days elapsed before treatment is begun.

After bites on the head and face, particularly when extensive or lacerating, 2 injections are given daily for 10 days, and the total amount administered is from 2 to 3 times that of the usual quantity.

Two examples will illustrate the present scheme of intensive treatment.

Case I—A farmer, age 28, was deeply bitten on the left hand and wrist by his own dog, October 6, 1926. The dog also bit 2 cows, and disappeared. These cows developed typical symptoms of rabies 2 months later and died. On December 17 treatment of the farmer was begun and it was continued intensively for 10 days. As shown in Table I, within the first 24 hours he was given 120 mg. (A), and during the next 9 days, 570 mg. of the infectious vaccine (B) which had been dried only 2 months previously and had therefore lost but little of its infectivity.

Case II—A boy, age 5, was severely bitten on the face, January 31, 1922. There was one deep wound over the left eyebrow, one on the chin, and a more superficial wound on the nose. Examination of the dog's head in the City Board of Health Laboratory had failed to show the presence of Negri bodies, but a guinea pig inoculated at the time developed symptoms 11 days later. Negri bodies were numerous in the brain. The boy was first brought in and treatment begun on the 13th day after the bite, 350 mg. of (A) being given during the first 72 hours. During the next 7 days, he received 350 mg. of (B) (see Table II).

TABLE I

TREATMENT IN CASE NUMBER I

Date	Mg.
Dec. 17/26 P.M.	60 A
Dec. 18/26 A.M.	60 A
P.M.	60 A
Dec. 19/26 A.M.	30 B
P.M.	30 B
Dec. 20/26 A.M.	30 B
P.M.	30 B
Dec. 21/26 A.M.	30 B
P.M.	30 B
Dec. 22/26 A.M.	30 B
P.M.	30 B
Dec. 23/26 A.M.	30 B
P.M.	30 B
Dec. 24/26 A.M.	30 B
P.M.	30 B
Dec. 25/26 A.M.	30 B
P.M.	30 B
Dec. 26/26 A.M.	30 B
P.M.	30 B
Dec. 27/26 A.M.	30 B

TABLE II

TREATMENT IN CASE NUMBER II

Date	Mg.
Feb. 12/22 P.M.	50 A
Feb. 13/22 A.M.	50 A
P.M.	50 A
Feb. 14/22 A.M.	50 A
P.M.	50 A
Feb. 15/22 A.M.	50 A
P.M.	50 A
Feb. 16/22 A.M.	25 B
P.M.	25 B
Feb. 17/22 A.M.	25 B
P.M.	25 B
Feb. 18/22 A.M.	25 B
P.M.	25 B
Feb. 19/22 A.M.	25 B
P.M.	25 B
Feb. 20/22 A.M.	25 B
P.M.	25 B
Feb. 21/22 A.M.	25 B
P.M.	25 B

During the past 17 years this vaccine has been given to 3,516 persons. In Table III will be found data on 2,032 of those treated.

Most of the treatments were sent by mail to the local physician with an enclosed questionnaire, but because in a large number of cases the physician either did not answer the questions as requested, or answered incompletely, the data in 1,484 cases are either entirely lacking or are too meager to justify their inclusion in this report.

TABLE III

DATA OF 2,032 CASES TREATED FOR RABIES

	Head	Hands and Forearm	Body and Lower Extremities	Contact	Total
Rabid	147	617	355	334	1,453
Probably Rabid	30	174	104		308
Unknown	19	100	87		206
Probably not Rabid	8	40	17		65
Total	214	931	563	334	2,032

Of all those treated, there has been only one failure. This was a farmer who, following a severely lacerating bite on his hand, July 1, 1913, began the treatment 5 days later. An intensive treatment was given for 7 days, but the patient insisted upon returning home for harvesting work. After a week of hard labor in the field during excessively hot weather, symptoms of rabies developed on the 20th day after the bite, the 14th day after the first injection.

I believe an important factor in our success is the intensive treatment given to all severely bitten patients.

One case of temporary post-vaccinal paralysis, occurring after a 10-dose treatment, has just been reported to me, but as yet I have not been able to obtain all the details.

No intensively treated patient has shown any paralysis. In my own personally treated cases reactions have been limited to local redness and swelling which disappeared promptly.

PROPHYLACTIC IMMUNIZATION OF DOGS

The prophylactic immunization of dogs presents an entirely different problem from that of men. The latter is one of necessity, while the former is a voluntary act for the prevention of a rare disease which is unlikely to occur. There are 2 prime requisites for a vaccine used as a prophylactic in dogs: first, its use must never result in the production of the disease itself; second, the immunity must be adequate to protect the animal, should it be exposed. The preparation must also be stable to permit distribution to veterinarians.

We believe that all of these requisites are found in our product. In its use in experimental work and in practical immunization of dogs,

not one of the animals has been infected by the vaccine and, so far as can be learned, no immunized dog has later developed rabies.

In all the earlier work the scheme for immunizing dogs followed that used in men. Beginning in 1915, dogs were given 6 injections of attenuated vaccine containing 125 mg. of the virus. Since 1920, when the method of dosage in men was altered, 300 dogs have been immunized with 3 injections of 30 mg. each of non-infectious vaccine (A), followed by 3 equal doses of the new (B) strain of attenuated virus.

It was evident, however, that 6 separate injections would be impractical and prevent its general use. Experiments were therefore undertaken to give the entire quantity in 2 doses—90 mg. of (A) followed 8 or 10 days later with 90 mg. of attenuated virus (B). These tests made on dogs, rabbits and rats have proved uniformly successful and entirely free from danger.

In one experiment 10 white rats were injected subcutaneously with 75 mg. of vaccine (A) and 5 days later were injected with 100 mg. of (B) which had been stored for 1 year in vacuo. At the same time 6 white rats were injected with 200 mg. of the same lot of (B). Twenty days later these 16 rats, together with 8 controls, were injected in the muscles of the neck with 1 c.c. of a thick emulsion made from the fresh brain of a dog that had died of rabies.

Four of the controls died of rabies. Negri bodies were found in their brains. None of the immunized rats developed rabies.

In a second experiment, 45 young white rats were injected subcutaneously with 200 mg. each of vaccine (B) which had been kept in vacuo for 8 months. Not one of these showed any symptoms of rabies during an observation of 3 months.

In a third experiment 28 young white rats were injected subcutaneously with 100 mg. each of virus (B) which had been kept in vacuo 27 days. Twelve days later 1 rat died, but no Negri bodies could be demonstrated in the brain. The others remained well for 3 months, when all were killed.

It is evident from these experiments that even in relatively large doses the vaccine is not infectious to white rats when given subcutaneously. The possibility that 1 rat may have developed rabies after a primary injection of (B) which was not attenuated, and which had not been preceded by the injection of a dose of non-infectious vaccine, is sufficient to justify the rule that no dog should be injected without a preliminary dose of non-infectious vaccine and that the second injection should always be with material whose infectivity has been somewhat lessened by storage in vacuo of at least 3 months.

Fifty dogs have been immunized by giving the vaccine in 2 doses. Not one of these animals has shown any symptoms of rabies, or any ill effect from that treatment.

Schoening's[3] experiments, and the fact that during the past year I have seen 5 rabid dogs which had been injected within less than a year with a single dose of phenolated vaccine, lead me to the conclusion that the degree of immunity resulting from a single injection of a killed vaccine is not adequate to protect a dog against all strains of street virus, and that the feeling of security from its use is not justified. As it has been found in distemper that dogs cannot be adequately immunized unless given a killed vaccine and a subsequent injection of a living virus, so I believe it will likewise be found in rabies that an effective immunization of dogs cannot be obtained by the use of a single injection of a killed vaccine. This should be reinforced, as in distemper, with a second injection of an attenuated but living virus.

CONCLUSIONS

In a total of 3,516 antirabic vaccinations, the uniformly successful treatment of every patient bitten on the head or face, with only 1 failure following a bite on the hand, warrants the conclusion that antirabic immunization with desiccated vaccine is as effective as by any other method.

Prophylactic immunization of dogs, to be effective, should consist of an injection of a non-infectious vaccine, reinforced later with a second injection of an attenuated but living virus.

REFERENCES

1. Harris and Shackell. *J. Infect. Dis.*, VIII: 47, 1911.
2. Harris. *J. Infect. Dis.*, X: 369, 1912; *ibid.*, XI: 397; *ibid.*, XIII: 155. *Ann. de l'Inst. Pasteur*, XXVI: 372, 1912. *J. A. M. A.*, LXVII: 923, 1916.
3. Schoening. *J. Agri. Res.*, XXX: 431, 1925.

School Psychologists in Switzerland

IN addition to the school medical service of Basel, which has been in existence for some years, the administrative authorities of that city recently appointed a physician as "school psychologist." The school psychologist will make psychological examinations of the pupils and prescribe treatment when necessary. Among his duties will be the determination of the causes of unsatisfactory school work and examination of children recommended by the teachers or physicians for special classes, such as classes for specially gifted children, or for backward children, or for those with certain physical or mental defects.

The school psychologist also will aid the vocational adviser by making the necessary psychological tests.—*Pro Juventute*, Zurich, Nov., 1928, p. 416.

Antirabic Vaccination by Means of Desiccated Virus

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FOR 18 years these laboratories have administered antirabic prophylactic treatment with material prepared along the lines indicated by Harris. We desire to tabulate the cases treated during the past 14 years, and to add a few observations that have been made on various properties of desiccated virus. As some modifications have been made in the technic proposed by Harris, it may be of value to describe briefly the methods used in the production, storage and administration of rabic virus, for the greater part of the time covered by this report.

Full grown, healthy rabbits, averaging 2,200 gm., are inoculated intracerebrally with an emulsion of desiccated fixed virus, the amount used being usually 0.004 mg. of material in 1 mil of sterile physiological salt solution. Injection is made after trephining, the material being deposited by means of a 24-gage needle, directly into the lateral ventricles. After 6 or 7 days the animals develop typical symptoms, and when complete paresis has intervened they are killed by ether narcosis.

The cord and brain are removed under aseptic conditions, stripped of their membranes and placed in a sterile mortar. Carbon dioxide snow is then added with constant mixing and trituration until first solidification, and later rather fine division have taken place. The ground material is spread in a thin layer over a cold sterile porcelain perforated plate that fits within a 25-cm. pyrex glass Scheibler desiccator previously sterilized and kept for a few hours at a temperature of — 12° C. A layer of sulphuric acid or phosphoric anhydride 2 cm. deep covers the bottom of the desiccator, and acts as dehydrating agent. A vacuum of 2 mm. of mercury is quickly produced within the desiccator, and it is stored at a temperature of — 12° C. to — 18° C. If the material has been spread in a layer averaging about 5 mm. thick, no difficulty is experienced in accomplishing desiccation within 48 hours.

The material is then scraped off by means of a sterile spatula, collected in a sterile mortar, and pulverized. The finely powdered material is placed in pyrex glass tubes 125 mm. long by 10 mm. in diam-

eter. These tubes are quickly sealed by flame and stored in a dark place at a maximum temperature of — 10° C., the usual temperature averaging between — 12° C. and — 15° C.

Notwithstanding the care exercised in preparing the virus, it is conceivable that at times bacterial contamination may occur. It is possible, however improbable, that spores of such organisms as *Clostridium tetani* may be in the carbon dioxide snow. Although the injection of such spores in man would, certainly in the great majority of cases, be followed by no ill effects, we have assured ourselves against such happenings by cultural control of every batch of virus prepared. Aerobic and anaerobic cultures are made from material obtained from each animal used, and also from each tube of completed virus. It is believed that these precautions have not been taken in vain, as we have never even experienced localized infections after subcutaneous injections of virus so prepared and so controlled.

STANDARDIZATION OF DESICCATED VIRUS

It has appeared necessary to establish arbitrary standards in dealing with desiccated rabic virus. So little is known of the agent concerned that the problem is one of great difficulty. The established methods of standardizing on the basis of protection, or on the basis of neutralization of toxic substances are, of course, not applicable. Throughout his work Harris used as a standard a " unit " which represented the smallest amount of desiccated material necessary to infect a rabbit. We employ a similar standard, designating it the " minimal infective dose," and defining it as the least amount of desiccated material which within 5 days after preparation and when kept at temperatures of — 12° C. to — 15° C. will cause paresis in a 2,400 gm. rabbit within 7 days following intracerebral injection. It is not claimed that this standard is of any great degree of accuracy, as naturally a number of factors enter into the question of infection. However, it is believed to be an advantage to have some fixed unchanging basis on which to establish the degree of infectivity of any particular batch of virus. There is no difficulty in producing a virus with a " minimal infective dose " of between 0.002 and 0.004 mg. when desiccation has been accomplished within 48 hours. If it has taken longer, the number of " minimal infective doses " will be greatly reduced per unit of material.

Desiccated virus may be kept in the dark at temperatures of — 12° C. over long periods without demonstrable loss of infectivity. One lot so stored contained the same number of " minimal infective doses " per mg. as when prepared 6 years previously. At refrigerator

TABLE I

STATISTICAL SURVEY OF CASES

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Totals
Number applying for treatment	859	938	1,040	993	879	667	750	650	705	905	1,014	1,304	1,440	1,492	13,636
Number of cases treated	223	148	324	369	300	174	154	218	249	445	495	474	759	793	5,125
Patients treated after injury by animals showing positive rabies by:															
Microscopic test	89	58	153	149	124	89	59	98	99	280	321	123	263	465	2,370
Biologic test	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10
Attacking animals not located	34	90	171	210	176	85	85	106	101	104	167	178	235	260	2,002
Rabies developed after treatment	0	0	0	0	1	0	1	0	0	0	0	0	0	3	5
Treatment paralysis	0	0	0	0	0	0	0	1	0	0	0	0	1	1	3

TABLE II

DISTRIBUTION OF LESIONS IN PATIENTS TREATED, INJURED BY ANIMALS PROVED TO BE RABID

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Totals
Head and face	10	4	11	9	16	10	5	6	5	15	20	16	14	29	170
Upper extremities	30	20	85	84	47	34	20	27	42	101	107	35	104	175	911
Lower extremities	30	16	35	37	34	20	22	38	32	107	142	53	95	186	847
Trunk	5	4	7	6	10	4	2	6	7	14	0	4	12	25	100
Multiple, including head and face	0	3	1	3	1	0	0	1	0	3	0	1	5	2	19
Multiple, excluding head and face	14	11	14	20	16	21	10	20	13	40	52	14	33	48	306

TABLE III

DISRIBUTION BY AGE OF TREATED CASES

Years	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
under 1	0	0	1	1	1	0	0	2	1	6	1	0	6	2
1– 3	19	17	29	21	27	19	13	15	20	31	37	30	40	35
3– 5	16	9	32	29	25	17	12	18	36	45	50	54	84	84
5–10	66	54	82	88	75	36	34	35	39	80	122	86	155	148
10–15	37	21	46	48	45	34	28	30	41	84	79	87	157	144
15–20	14	12	23	35	17	14	25	20	15	45	36	44	45	60
20–30	25	14	42	48	35	21	11	29	25	53	59	48	80	101
30–40	21	10	30	39	35	13	14	37	40	45	54	52	89	92
40–50	14	9	21	31	21	15	13	15	17	24	29	34	56	53
50–60	9	2	15	21	16	4	2	8	7	18	22	23	28	58
60–80	2	0	3	8	3	1	2	9	8	14	6	16	19	16

temperature (8° C. to 12° C.) infectivity may last approximately 3 years. At higher temperatures, infectivity is rapidly lost, never, in our experience, lasting longer than about 60 days at room temperatures (23° C. to 28° C.). We do not believe that there is any relation between infectivity and immunizing power.

METHODS OF ADMINISTRATION

Treatment has been carried out by administering subcutaneously an initial dose of 250 " minimal infective doses," doubling the quantity daily until a maximum of 2,000 was reached. We never consider the ratio existing between infective and non-infective material in the virus used. As a rule, the virus is 2 or 3 months old before use, but as it loses practically none of its infective power during that time, we are always dealing with a freshly prepared virus as far as infectivity is concerned. Usually a total of 11 treatments of 17,750 minimal infective doses are given, except in severe penetrating injuries of the face and scalp, when 15 treatments, or a total of 25,750 minimal infective doses, are given. In children under 3 years of age one-half the amount is administered.

During the last 14 years 5,125 patients have been treated with virus, generally prepared as outlined. Tables I and II show the treated cases and sites of injury by proven rabid animals. Table III classifies the treated cases according to age.

DIAGNOSIS OF RABIES

In this series, positive diagnosis of rabies was made only on finding Negri bodies (microscopic test), or on production of clinical rabies after intracerebral inoculation of test animals (biologic test). This latter we have discarded. With infected, decomposed brains it is useless, as invariably the test animals succumb to purulent meningitis when injected with such material. With satisfactory material it is too time consuming. Examination of brain sections, preferably cerebellar, prepared by a rapid fixation paraffin embedding method, and stained by Mallory's aniline blue, has been found the diagnostic method of choice.

POST-VACCINAL COMPLICATIONS

About 25 per cent (24.5 per cent for 1920 to 1923 inclusive) of the treated patients developed malaise and slight elevations of temperature. Approximately 10 per cent (9.8 per cent for the years 1920 to 1923 inclusive) developed a generalized urticarial-like eruption or localized erythematous wheal-like lesions at the sites of injections, probably due to sensitization by foreign protein. The gener-

alized rash proved extremely disagreeable and was accompanied by high temperature (102°–105°) in 0.2 per cent of the cases treated. Its usual time of appearance was between the 3d and 10th days of treatment, in some cases persisting as long as 5 days, the average duration being 36 hours. Its occurrence never prevented continuance of treatment.

Three cases of so-called "treatment paralysis" have occurred since our last report. One, in 1922, consisted of a transient weakness of the lower extremities in an adult white male, coming on the first day after completion of an 11-day treatment. It lasted 15 days and was treated by massage, hot baths, and bitter stomachics. Another case developed in a white male, 35 years of age, involving the facial muscles and the upper right extremities on the 8th day of treatment. Its duration was 10 weeks. Antirabic treatment was discontinued, and not again renewed.

Another case, in 1928 in an adult male, 49 years of age, terminated fatally, the immediate cause of death being ascending infection of the urinary tract after paresis of the lower extremities. Symptoms appeared after 5 injections. The offending animal did not have rabies. In addition to these authentic cases, it is possible that other slight and transient neuro-motor disturbances occurred, their nonrecognition being readily understood considering the type of patients treated by us.

We have had 5 deaths (non-protection) following complete treatment. The details of one (1919 series) is given in a previous report.[1]

The fatality in the 1921 series occurred in a negro, male (L. J.) 56 years of age, 44 days after completion of treatment, following slight injury to the hand by a rabid dog. In the 1928 series the first case of non-protection occurred in a negro child (D. L.) 10 years of age, symptoms developing 2 months after completion of treatment. The second, a man 44 years of age (E. S.), developed 2 days after completion of treatment. The third case occurred in a boy 14 years of age (T. G.), symptoms coming on 7 weeks after completion of treatment for bite on the hand by a rabid dog.

SUMMARY

There are reported 5,125 prophylactic antirabic vaccinations by a modified Harris method covering a period of 14 years. Of these, 2,380 followed injuries by proven rabid animals. Three cases of treatment paralysis, one terminating fatally, and 5 cases of non-protection after complete treatment occurred in the series.

REFERENCE

1. D'Aunoy, R. *J. Infect. Dis.*, 29: 261, 1921.

Iodized Salt

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SINCE the prevalence of simple goiter in Michigan and its relation to iodine deficiency was outlined in a preliminary report by the Michigan Department of Health,[1] increasing importance has been attached to a universal medium for correcting this iodine deficiency. Of all the means suggested the most effective and generally accepted appears to be iodized salt, for obvious reasons.

The Michigan salt manufacturers were, I believe, the first group to undertake supplying iodine in the form of iodized salt, giving this important element to the people of this and other states at no additional cost.

The general adoption of this procedure in coöperation with the medical profession led to a preliminary survey and examination of the many different brands of iodized salt appearing on the market, with chemical analyses to determine the iodine content. The findings showed a marked variation in iodine content which did not appear warranted, and lessened the effectiveness of iodized salt for the purpose intended.

A coöperative study of the manufacturing methods and conditions under which iodized salt was produced was undertaken for the purpose of determining whether this variation could be eliminated and a uniform product be produced. As a result, a number of outstanding features bearing directly on the problem were observed which, if taken into consideration, would be of material assistance in producing a uniform product.

Two iodine compounds, sodium and potassium iodide, are used generally in the manufacture of iodized salt in Michigan. Claims were made by some that sodium iodide possessed a distinct advantage over the potassium salt, because of a slight difference in physiological properties. However, there were points in favor of the use of one salt or the other for physical or manufacturing reasons. The majority of manufacturers were persuaded to use the sodium salt because of its apparent advantages. Many authorities maintain that in an iodized salt prepared by using potassium iodide the percentage of po-

tassium iodide to salt is so small that when the mixture goes into solution in the digestive system there is such a large excess of sodium over potassium that the effect of potassium is negligible. In other words, if the physiological action of sodium is desirable there is such an excess of it in the salt that it more than counteracts the slight trace of potassium present in potassium iodized salt. As sodium iodide takes up moisture more freely, decomposing, discoloring and freeing iodine in the process, it is not so well suited to the preparation of iodized salt as potassium iodide.

There have been a number of attempts made and, I believe, successfully, to use organic iodides in the preparation of iodized salt. In Switzerland a number of organic iodides have been used quite successfully, and they are less likely to undergo decomposition, thereby possessing some advantage over the inorganic products. The cost, however, is greater and would probably have some bearing on their use. In the last few years W. L. Chandler of the Department of Bacteriology, Michigan State College, has developed a form of organic iodine which is claimed to have advantages over the inorganic products. Whether the use of this form of iodine in iodized salt will be advantageous in so far as the goitrous condition in Michigan is concerned remains to be determined.

The net results of the joint survey pointed out the necessity for a standardized method for mixing iodine and a uniform control procedure.

RECOMMENDED METHOD OF MIXING

Pulverize potassium iodide. Weigh accurately—not measure—2 lb. 2/2 oz. of the ground iodide to every 97 lb. 12½ oz. of calcium phosphate.* Mix in a batch mixer for at least 5 minutes. Next grind the mixture to pass a 100-mesh sieve, or finer, and mix again in the batch mixer for at least 20 minutes. The actual iodine content should be checked at this point by analysis.

Weigh accurately 1 pound of this stock mixture for every 99 lb. of dried salt and mix in a batch mixer for sufficient time to give a uniform product as determined by analysis. Each type of mixer will probably have a different time requirement. Ten minutes should give a uniform product with the average mixer.†

Due to the small quantity of iodine as compared to the large bulk of salt, the batch mixer is less liable to give decided variations in uniformity of product than is the continuous mixer. When dealing with a substance as potent as iodine, extreme care should be taken to avoid an overdose as well as to assure the consumer of the presence of iodine.

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* Because the specific gravity of calcium phosphate is more nearly the same as salt, it lends itself to a better mixture than do most other drying agents. It also has some value as a mineral dietary adjunct for stock.

† Some manufacturers are using an extra mixing at this point. As an added assurance of obtaining a uniform product, the iodide-phosphate mixture is first mixed with a portion of the salt and later the remainder of the salt is added.

CONTROL

Accurate control is very essential because the percentage of iodine recommended is based upon reliable statistics. It is therefore essential that iodized salt adhere closely to this figure. It is of prime importance that the original iodide and dryer mixture be carefully analyzed for uniformity of iodine content. A sufficient number of samples of the finished product should be taken from each batch, or every hour's run, and the actual iodine content determined.

DETERMINATION OF IODINE IN IODIZED SALT

There are several recognized methods for the determination of iodine in the presence of chlorides. Most of them are either not applicable or are too unwieldy to be feasible in the case of iodized salt. The following method was worked out by the writer and found to be both fast and accurate: *

METHOD

Reagents:

1. Syrupy phosphoric acid. U.S.P.
2. Carbon disulphide c.p. This must be water clear and if not should be redistilled.
3. Hydrogen peroxide. U.S.P. Preserve in a cool, dark place.
4. Standard iodide solution is made by dissolving 0.2214 gm. of potassium in a liter of distilled water. It is not necessary to use salt and dryer in connection with this standard solution. Five c.c. of this solution represent 5 gm. of iodized salt containing 0.0221 per cent potassium iodide.† Preserve in a cool, dark place or make up fresh.

Weigh out 5 gm. of the sample. Dissolve in 25 c.c. of water in a separatory funnel.

Prepare at the same time two standards using 4.5 c.c. and 5.5 c.c. of the standard iodide solution. From this point, proceed with both the sample and standards as follows:

Add 5 c.c. of phosphoric acid. Pipette exactly 10 c.c. of carbon disulphide into the mixtures. Add 20 c.c. of hydrogen peroxide and rotate each for 5 minutes. Draw off portions of the lower disulphide layer through a pledget of absorbent cotton into test tubes of equal diameter, ⅜ or ½ inch preferably. Stopper tubes securely and compare the color of the sample with that of the two controls.

These controls represent a 10 per cent variation of iodine content. The sample should fall within the range of the two. If it does not, further mixing or adjusting of the batch will be necessary. A number of samples can be run at the same time, using the same two controls.

After iodized salt had been manufactured and marketed for a considerable time the director of the Bureau of Foods and Standards of the Michigan Department of Agriculture caused a number of representative samples of the different brands as offered for sale in the regular trade channels to be collected and submitted to the laboratories for determination of the iodine content (see Table I).

* This method may be used as an accurate, quantitative laboratory procedure by the use of a Duboscq type of colorimeter, in which case one control made with 5 c.c. of the standard iodide solution is used as the standard of comparison.

† This is recommended by the Michigan Department of Health and represents the iodine equivalent of 0.02 per cent of sodium iodide calculated to potassium iodide.

TABLE I

Sample No.	Iodine Claimed Per Cent	Iodine Found Per Cent	+ Excess − Deficiency Per Cent	PRINCIPAL LABEL
71320 A–59	.02	.002	−.018	Iodized Salt Calcium Phosphate 1.00% Potassium Iodide .02% Net Weight 2 lb.
71378 J–420	.02	.019	−.001	Iodine Table and Cooking Salt Contains about .02% of 1% Potassium Iodide Net Weight 2 lb.
71384 V–641	.02	.02	———	Prepared Iodine Table and Cooking Salt Added Ingredients, Sodium Iodide .02% Carbonate of Magnesium .98% Net Weight 2 lb.
71495 Y–81	.02	.007	−.013	Iodized Salt Contains .02% Sodium Iodide Net Weight 2 lb.
71526 II–1	.02	.005	−.015	Special Prepared Free Running Salt with Iodine 1.0% Calcium Phosphate .02% Sodium Iodide Net Weight 2 lb.
71316 A–58	.02	.014	−.006	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71373 V–643	.02	.017	−.003	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71380 J–422	.02	.0026	−.0174	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71310 A–55	.02	.019	−.001	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71372 V–642	.02	.01	−.01	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71377 J–419	.02	.0153	−.0047	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.

TABLE I (*Cont.*)

Sample No.	Iodine Claimed Per Cent	Iodine Found Per Cent	+ Excess − Deficiency Per Cent	PRINCIPAL LABEL
71424 V-79	.02	.0152	−.0048	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71345 A-60	.02	.018	−.002	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71376 J-418	.02	.018	−.002	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71431 V-652	.02	.021	+.001	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71311 A-56	.023	.018	−.005	Iodized Salt Potassium Iodide .023% Calcium Phosphate 1.00% Net Weight 2 lb.
71356 V-78	.02	.0133	−.0067	Iodized Salt Never Cakes or Hardens Potassium Iodide .02% Net Weight 2 lb.
71379 J-421	.023	.016	−.007	Iodized Salt Potassium Iodide .023% Calcium Phosphate 1.00% Net Weight 2 lb.
71463 V-660	.02	.0184	−.0016	Iodized Salt Never Cakes or Hardens Potassium Iodide .02% Net Weight 2 lb.

It will be noted that there is a deficiency in every instance except one.

The question naturally arises as to whether the deficiencies are due to a loss of iodine after manufacturing or to poor mixing. It has been

demonstrated a number of times that with carefully controlled manufacturing processes iodine may be incorporated in a fairly uniform manner throughout the mix. There are undoubtedly losses due to exposure and other conditions to which the manufactured product is subjected.

The laboratories have examined for iodine content many specimens of iodized stock salt in which the department has been interested because of its use and value for alleviating conditions found in newborn colts, calves, pigs, lambs, etc. After storing specimens under a number of different conditions it was readily demonstrated that many factors were influential in liberating iodine from salt.

This question was studied quite thoroughly under controlled conditions by Arnold H. Johnson and V. L. Harrington of the Chemistry Department of the Montana Agricultural Experiment Station. Their findings are quoted:

> Iodized salts stored in atmospheres of relative humidities of 50 per cent lose smaller quantities of their iodine than salts stored under similar conditions at other humidities.
>
> Iodized salts rendered alkaline by the addition of $NaHCO_3$ lose practically none of their iodine during storage, while neutral salts or salts rendered acid lose appreciable quantities.
>
> Salts iodized with KIO_3 lose none of their iodine when stored for extended periods.
>
> Exposure of iodized salts to sunlight effects a loss of iodine from neutral or acid salts; only a slight loss from salt rendered alkaline; and practically no loss from salts iodized with KIO_3.
>
> Exposure to heat alone effects losses of iodine from acid, neutral, and alkaline iodized salts, and from salt iodized with KIO_3, in precisely the same order as did exposure to sunlight.
>
> Exposure to light and heat simultaneously effects greater losses of iodine from salts of neutral or acid reaction than exposure to light alone or heat alone. In the case of iodized salts of alkaline reaction the losses of iodine are again insignificant or negligible, even though the salts are exposed to light and heat simultaneously.
>
> The quantity of iodine liberated from a neutral salt iodized with KI appears to depend on the quantity of KI present.

REFERENCE

1. *Reprint Series No. 21*, Michigan Department of Health.

Typhoid Fever in a Rural Village of Porto Rico Due to a Surface Well

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IN a previous report[1] the writer discussed the typhoid fever problem in Porto Rico in general, pointing out some of the outstanding epidemiological features of the disease as observed in the island. The present paper is a discussion of an intensive study made of an outbreak which developed in Judea, a village located in the municipality of Utuado, following the recent hurricane.

The investigation of the outbreak included:

An epidemiological study of all the typhoid fever cases reported or located in the village

A special survey of the entire population of the village to obtain some knowledge of its composition, as well as the sources of water and food supplies and the sanitary status of the people

A special investigation to determine the sources of infection of the outbreak, including a bacteriological examination of water from a well suspected to have originated the outbreak

The municipality of Utuado, one of the 77 into which the island of Porto Rico is divided, is located in the central and western part. It has a town with 4,093 inhabitants, the remainder of the population totalling 34,523 persons, distributed in 23 rural districts.

Arenas, one of the rural districts, with an estimated population of 2,075 persons in 1928, has a village where slightly over 600 people live. Because of the proximity of this village to the town of Utuado, the water supply of the latter was extended to it. Previous to the recent hurricane, the people had 3 main sources of water: a spring located at the bottom of a hill; a surface well situated close to a creek which crosses the village; and the public water supply from the town of Utuado. Since the aqueduct was damaged by the cyclone, water from this source was not available during 2 weeks following it. Although the town has a sewerage system, there are no sewer connections in the village. The disposal of excreta is in latrines, some of very poor construction.

No accurate records of the occurrence of typhoid fever in the village in previous years were available, but from the information col-

TABLE I

DATES OF ONSET

Week Ending	Number of Cases with Onset	Number of Patients Taken to Bed
Sept. 29	4	2
Oct. 6	5	5
Oct. 13	6	3
Oct. 20	7	7
Oct. 27	10	10
Nov. 3	6	8
Nov. 10	3	5
Nov. 17	–	1
Nov. 24	1	1
Total	42	42

lected in a house to house canvass, it appears that these people have been comparatively free from the disease in recent years. A history of a probable attack of typhoid fever, during the last 5 years, was obtained from only 6 persons in the village. Two of these died and none was confirmed by bacteriological examination. Forty-six cases were reported from the village during the present outbreak, 4 of which were eliminated because they were not typhoid fever. All others were confirmed bacteriologically and 4 terminated in death.

The dates of the onset of first symptoms and the dates on which the patients were confined to bed were as shown in Table I.

The chronology of the outbreak suggests massive infection with its maximum intensity in the latter part of September.

The cyclone occurred on the 13th of the same month, and on this date that group of people in the village who had used water from the public water supply of Utuado, because of the damage to the aqueduct,

TABLE II

AGE AND SEX OF THE CASES

Age Groups	Males		Females		Both Sexes	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
0– 4	2	10.53	1	4.35	3	7.14
5– 9	5	26.31	2	8.69	7	16.67
10–14	4	21.05	2	8.69	6	14.29
15–19	1	5.26	7	30.43	8	19.05
20–24	1	5.26	4	17.39	5	11.90
25–29	2	10.53	1	4.35	3	7.14
30–34	–	——	2	8.69	2	4.76
35–39	2	10.53	1	4.35	3	7.14
40–44	2	10.53	1	4.35	3	7.14
45–49	–	——	–	——	–	——
50–54	–	——	–	——	–	——
55–59	–	——	1	4.35	1	2.38
60 over	–	——	1	4.35	1	2.38
Total	19	100.00	23	99.99	42	99.99

began using water from a surface well located nearby. Table II gives age and sex of cases investigated.

Males under 20 apparently furnished a disproportionately large percentage of the cases, though the numbers are too small to be significant.

The age groupings and sex of the cases and those living in the village who were not attacked are presented in Table III.

TABLE III

AGE AND SEX OF RESIDENTS AND CASES

Age Groups	Males				Females				Both Sexes			
	Persons		Cases		Persons		Cases		Persons		Cases	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 20	150	52.26	12	63.16	200	57.47	12	52.17	350	55.12	24	57.14
Over 20	137	47.74	7	36.84	148	42.53	11	47.83	285	44.88	18	42.86
Total	287	100.00	19	100.00	348	100.00	23	100.00	635	100.00	42	100.00

The number of persons of both sexes under 20 in the village exceeded those over 20 years of age. The lengths of residence of the patients and controls were as given in Table IV.

TABLE IV

LENGTH OF RESIDENCE OF CASES AND CONTROLS

Length of Residence	Cases		Controls	
	No.	Per Cent	No.	Per Cent
1 year or less	12	28.57	181	28.50
2 years	12	28.57	135	21.26
3 years	9	21.43	181	28.50
4 years	8	19.05	92	14.49
5 or more years	1	2.38	46	7.24
Total	42	100.00	635	99.99

Although 28 per cent of the cases occurred among persons who had resided in the village less than 1 year, and over 95 per cent in those who had resided there less than 5 years, this was also true of those not attacked; so the disease was not excessively prevalent among newcomers.

Whether any of the patients or the control group had been absent from home during 30 days previous to the outbreak was determined, with the results shown in Table V.

TABLE V

ABSENCE FROM VILLAGE

Statement Regarding Travel	Cases		Controls	
	No.	Per Cent	No.	Per Cent
Yes	2	4.76	58	9.13
No	40	95.24	577	90.87
Total	42	100.00	635	100.00

The sanitary condition of the premises and the economic status of the patients and controls were as presented in Table VI.

TABLE VI

SANITARY AND ECONOMIC STATUS

	Economic				Sanitary			
	Cases		Controls		Cases		Controls	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Good	1	2.38	29	4.57	2	4.76	43	6.77
Fair	2	4.76	63	9.92	15	35.71	196	30.87
Poor	25	59.52	334	52.60	17	40.48	268	42.20
Very poor	14	33.33	209	32.91	8	19.05	128	20.16
Total	42	99.99	635	100.00	42	100.00	635	100.00

As one would expect to find in any rural district of Porto Rico, the economic and sanitary status of the people was rather low. The epidemic, however, was not confined to those of any economic or sanitary status, the cases being distributed in proportion to the number of persons in each group.

Whether or not the persons or patients had eaten ice cream or had meals away from home during 30 days previous to the onset of the outbreak was determined, with the results shown in Table VII.

TABLE VII

INVESTIGATION REGARDING FOOD EATEN

	Ate Ice Cream				Had Meals Away from Home			
	Cases		Controls		Cases		Controls	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Yes	17	40.48	218	34.33	1	2.38	44	6.93
No	25	59.52	417	65.67	41	97.62	591	93.07
Total	42	100.00	635	100.00	42	100.00	635	100.00

The dealers supplying milk, with the corresponding incidence rate per 1,000 for each, are shown in Table VIII.

TABLE VIII

INCIDENCE RATE BY DEALER SUPPLYING MILK

Dealers	Cases	Persons	Attack Rate per 1,000
J. G.	9	78	115.38
C. N.	2	31	64.52
A. M.	4	46	86.95
L. G.	11	141	78.01
C. Bros.	5	41	121.95
Condensed milk	1	16	62.50
Own cow	3	47	63.83
Other sources	4	102	39.22
Unknown	3	103	29.13
None	—	30	
All sources	42	635	66.14

The cases were distributed in fair proportion among 5 main dealers. All the patients investigated boiled their milk before using, a habit

common among the people living in tropical countries. Table IX states the method of disposal of excreta.

TABLE IX

EXCRETA DISPOSAL

Method of Disposal	Cases		Controls	
	No.	Per Cent	No.	Per Cent
Latrine in the house	2	4.76	48	7.56
Latrine outside	35	83.33	485	76.38
No latrine	5	11.90	102	16.06
Total	42	99.99	635	100.00

Table X gives the dates of onset of first symptoms of all cases in households in which 2 or more cases occurred.

TABLE X

DATE OF ONSET

Family	First Case		Second Case		Third Case		Fourth Case	
	Case No.	Date of Onset	Case No.	Date of Onset	Case No.	Date of Onset	Case No.	Date of Onset
A	1	Sept. 23	5	Oct. 1	28	Oct. 23	34	Oct. 26
B	4	Sept. 28	17	Oct. 14	18	Oct. 15		
C	8	Oct. 4	9	Oct. 4				
D	10	Oct. 9	23	Oct. 20				
E	11	Oct. 10	42	Oct. 10				
F	12	Oct. 11	25	Oct. 21	40	Nov. 1		
G	14	Oct. 13	31	Oct. 25				
H	22	Oct. 19	24	Oct. 21				
I	32	Oct. 25	41	Nov. 4				

In families C, E, and H, contact infection was impossible. In families D, F, G, and I, infection through contact was possible but not probable, as the time between primary and secondary cases was presumably too short. The dates of onset of primary and secondary cases in those instances where infection could have been contracted through visiting were as presented in Table XI.

TABLE XI

INTERVALS BETWEEN PRIMARY AND SECONDARY CASES

Primary Case		Secondary Case		Interval in Days between Primary and Secondary Cases
Case No.	Onset	Case No.	Onset	
8	Oct. 4	39	Oct. 31	27
9	Oct. 4	20	Oct. 15	11
24	Oct. 21	37	Oct. 29	8
14	Oct. 13	30	Oct. 24	11
19	Oct. 15	29	Oct. 23	8
9	Oct. 4	13	Oct. 14	8
32	Oct. 25	33	Oct. 26	1

In case number 33 contact infection can definitely be excluded. In the rest, except case 39, the incubation period was perhaps too short for contact infection, unless a heavy dose of germs was ingested. This might have happened through multiplication of typhoid bacilli in a

contaminated food partaken by any of these patients. All, however, denied having eaten anything during their visits to other cases.

It has been definitely established that when typhoid fever is introduced into a community where the methods of excreta disposal are faulty and where the care and precautions at the bedside of patients are obviously defective, infection through contact always plays a part in the dissemination of the disease. In view of the above facts it is presumed that personal contact, both direct and indirect—in the present instance because of the unusual conditions prevailing in the village after the hurricane—although not the major factor was an agent of some importance in the spread of the outbreak.

The sources of water used by the patients and controls during 30 days previous to the outbreak are given in Table XII.

TABLE XII

ATTACK RATE BY SOURCES OF WATER SUPPLY

Source of Water	Persons in Village Using Each Source	Cases Using Each Source	Attack Rate per 1,000 among Each Group
Aqueduct and suspected well	226	28	123.89
Spring alone	139	1	7.19
Aqueduct and spring	46	2	43.48
Aqueduct, spring and suspected well	54	5	92.59
Spring and suspected well	30	5	166.67
Aqueduct, well, other sources	19	1	52.63
Spring, other sources	17	—	—
Aqueduct, other sources	49	—	—
Aqueduct, spring, other sources	22	—	—
Various sources	33	—	—
All sources	635	42	66.14
Well water	329	39	118.54
Not well water	306	3	0.98
Both	635	42	66.14

The risk of attack among those who used well water was 118.54 per 1,000, while the risk of attack among the group who did not was 0.98 per 1,000. Stating it in a different way, 329 people who used well water, or 51.81 per cent of the total population, contributed 39 cases or 92.86 per cent of the total number, while 306 people who did not use well water, or 48.19 per cent of the total, furnished only 3 cases, or 7.14 per cent of the total number recorded.

On the basis of probability, in a normal group, the expected number of cases among the people who did not use well water was 20, and only 3 occurred, while the expected number in the group who used it was 21, and 39 occurred. The probability that such a distribution was due to chance alone is 1 in 10,000. Two out of the 3 cases which occurred among those who did not use the well water gave a history of

direct intimate personal contact with a previous case and were regarded as probable contact patients.

CONTAMINATION OF THE WELL

The investigation conducted to locate the possible sources from which the well was contaminated revealed that on August 14 a young woman was taken ill with typhoid fever in the village. This patient had clinical typhoid, and her Widal on August 29 was positive. Her home was in close proximity to the well. The excreta from the patient was disposed of without the addition of any disinfectant, in a poorly constructed latrine about 6 yards from the well. The opportunities for its contamination with the privy contents were ample, especially after the heavy rains which accompanied the hurricane.

The bacteriological examination of a sample from the well, obtained on October 26, gave the following results:

Bacteria per c.c. innumerable
Fermentation in 10 c.c. (48 hours) 80 per cent
B. coli in 10 c.c. present
B. coli in 1 c.c. present
B. coli in 0.1 c.c. present

SUMMARY

The explosive character of an outbreak of typhoid fever following the recent hurricane among the people living in Judea, a semirural village of the municipality of Utuado, P. R., together with the high incidence rate among the population in the village, immediately suggested a vehicle in use by a large proportion of the people, as the chief factor of causation. Water from the public supply of Utuado was eliminated because the people in that town escaped. Only 4 cases occurred in that town with a population of over 4,000, 90 per cent of whom used the public water supply. The infection in 4 cases which occurred in a single family was traced to probable contact with a case in Judea, through a cook who nursed her sister, a typhoid patient in the village, and prepared all the food for this family in the town. Milk, ice cream, and other foods were excluded as contributing to the spread of the outbreak.

Water from a surface well used by about one half of the people in the village after the hurricane was regarded with suspicion. The result of the epidemiological investigation confirmed the suspicion and this water was regarded as the major factor in the causation of the outbreak. Although the people who used water from this well formed only 51 per cent of the total population of the village, this group contributed 92 per cent of the cases. Infection in 2 out of only 3 cases who did not use this water supply was definitely attributed to contact

with previous cases of the disease, leaving only 1 case in the group who did use well water whose origin was not determined.

The evidence seems to warrant the conclusion that water from the surface well was the major factor in the causation of typhoid fever during the recent outbreak in the village of Judea, and that contact infection acted as a secondary contributing factor.

REFERENCE

1. Morales, E. Garrido. *Porto Rico Review of Public Health and Tropical Medicine*, 4: 381, 1929.

Spanish Law on Maternity Insurance

COMPULSORY maternity insurance was established in Spain by a law passed March 22, 1929, the provisions of which differ considerably from those of the provisional decree on the same subject of August 21, 1923. The purpose of the law, like that of the decree, is to give effect to the international draft convention on the protection of maternity ratified by Spain in 1922.

According to the new law all wage earning women between the ages of 16 and 50, except those in domestic service, must carry maternity insurance. Each insured woman will pay 7.50 pesetas (about $1.50) annually, and her employer will pay an equal amount. The State is to contribute to the insurance fund 50 pesetas for each confinement and other unspecified amounts for nursing benefits.

Every insured woman is entitled to medical aid and medicines during pregnancy and confinement and to a weekly cash benefit for the 6 weeks following her confinement, during which she is required to stay away from work. Her place must be kept for her by the employer for a certain length of time. Upon presenting a physician's certificate of pregnancy, an insured woman has the right to stay away from work for the 6 weeks before her confinement, and a benefit is paid during that time also.

The amounts to be paid as benefits will be set in subsequent regulations.

The law also provides for the establishment of a Maternity and Infancy Fund (*Fondo Maternal e Infantil*) to be used for establishing new maternity and infancy health centers and for aiding those already in existence. The resources of the Fund will consist of a certain percentage of the premiums paid by the insured women and of donations from public and private sources.

When the available resources permit, a cash benefit may be paid beyond the prescribed period if the mother is ill as a result of childbirth, or if the mother loses her employment through such illness, or if the child is ill.

The general administration of the law will be in the hands of the National Provident Institute, which administers also the law on old-age pensions. To see that the women are given the medical aid, the cash benefit, and the rest period prescribed by law, local maternity insurance organizations will be established in certain cities. In other places local administration of the law will be carried on by certain approved mutual aid societies, public child welfare boards, public boards of education, or public health boards, in which the insurance organizations, the workers, and their employers must be represented.

The law prescribes fines for employers and employees who fail to comply with it.—*Gaceta de Madrid*, Mar. 24, 1929, pp. 2202–2206.

Nativity and Disease Susceptibility

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MORTALITY rates from diseases of advanced life in the United States are uniformly higher among the foreign born than among the native born. Furthermore, the mortality rates from these causes are much higher among the Irish and German born than among those born in Italy, Poland and the former Austro-Hungarian empire. In view of these surface indications investigators have frequently assumed that the foreign nationals in the United States, and particularly the Irish and Germans, were particularly subject to whatever disease happened to be in question.

In making these statements such investigators have lost sight of the rather obvious fact that the foreign born are on the average older than the native born. The native born population is regularly distributed with regard to age with the largest number in the first age group and numbers diminishing steadily with advancing years. The foreign born population on the other hand is small in the age group under 5 years, since the children of the foreign born are themselves usually native born. In the population of Pennsylvania in 1920 the median age of the native born whites was 21.4 years, with quartiles at 9.3 and 39 0, while in the foreign born population the median age was 38.4 years, with quartiles at 29.4 and 49.8.

In 1927 there were, according to the state tabulation, 9,283 deaths in Pennsylvania from cancer and 20,771 from heart disease, giving crude death rates for these causes of 95.4 and 214.0 per 100,000 population. The median age at death from cancer was 62.2 years and from heart disease 66.3 years. The crude death rates by nativity for cancer were, native born 81.2 and foreign born 180.2, and for heart disease, native born 184.0 and foreign born 382.3 per 100,000 population. But by computing age specific death rates, multiplying these rates by the estimated native and foreign population at each age group and adding the products, it is found that on the basis of age alone the expected number of cancer deaths by nativity would be 7,096 native born and 2,187 foreign born. The actual figures were 6,843 native born, 2,343 foreign born and 97 unspecified. For heart disease the expected distribution of deaths was native 16,024 and

foreign 4,747 as compared with an actual distribution of 15,509 native, 4,970 foreign and 292 unspecified. In view of the difficulty of making satisfactory population estimates by age, 7 years after an enumeration, these results are remarkably close, and show that age for age there is little difference in the mortality from cancer and heart disease as between the native born and the foreign born.

Roughly estimating the numbers of foreign born in Pennsylvania by country of birth, the crude death rates for each of the principal national groups from cancer and heart disease were as shown in Table I.

TABLE I

Country of Birth	Rates per 100,000 Population in Each Nationality	
	Cancer	Heart Disease
United States	81	184
Ireland	428	1,127
Germany	480	1,120
Italy	105	195
Austria-Hungary	106	201
Poland	111	242
Russia	127	290
All Other	217	393

It will be noted that the death rates for the Irish and Germans are extremely high, while the natives of Italy, Austria-Hungary, Poland and Russia have rates little above those of the native born population. In the group of "all other countries" the largest numbers are from Great Britain, the Scandinavian countries and Greece.

The U. S. Census does not give the age distribution of the separate national groups of the foreign born population; so it is impossible to calculate directly the expected mortality of these groups on the basis of age. But it is well known that the waves of Irish and German immigration came early, while the Italian, Austro-Hungarian, Polish and Russian immigrations followed after the influx of the Irish and Germans began to decline. In the United States as a whole the populations of Irish and German birth were greater in 1890 than in any other census year. That was nearly 40 years ago, and the survivors of that early immigration must now be well advanced in age. On the other hand, in spite of the practical suspension of immigration during the World War, the populations of Italian, Austro-Hungarian, Polish and Russian birth were larger in 1920 than in any previous census year. It is certain therefore that the median ages of the living Irish and German born populations are far higher than the median ages of those born in the other countries named. The cancer and heart disease death rates of the Irish and German born correspond with the age specific death rates in the entire population for the group between

the ages of 60 and 69 years. Considering the time which has elapsed since the peak of the immigration from these countries it is entirely possible that the median age of the Irish and German born in Pennsylvania is somewhere between 60 and 70 years. The death rates from these causes among the other national groups mentioned correspond with the age specific death rates of the group between 40 and 49 years. Since the median age of the foreign born in Pennsylvania was 38.4 years in 1920, and since the foreign born in Pennsylvania were largely of this later immigration, and further since there has been very little immigration since 1920, it is very probable that the median age of the natives of these countries in Pennsylvania was between 40 and 49 years in 1927.

While the numbers of living persons by country of birth and age are not available, the deaths by nativity and age give some indication of the relative ages of the national groups in which the deaths occur. Table II gives for both cancer and heart disease the median age at death and first and third quartiles for all deaths from these causes in Pennsylvania in 1927 and for each of the indicated national groups.

The differences in age classification between the Irish and Germans and the other foreign born are very striking. In cancer, the median age at death of the German born is 13 years higher than for those born in Austria-Hungary, and in heart disease the difference is still greater. Since there are comparatively few deaths from either of these diseases under the age of 45, which is the lowest age on the table for a first quartile, the differences in age groupings between the

TABLE II

COMPARATIVE AGES AT DEATH FROM CANCER AND HEART DISEASE BY COUNTRY OF BIRTH
Pennsylvania, 1927

Country of Birth	Cancer			Heart Disease		
	1st Quartile	Median	3d Quartile	1st Quartile	Median	3d Quartile
	Years	Years	Years	Years	Years	Years
Total	51.8	62.2	71.1	53.5	66.3	75.7
United States	52.0	62.7	71.7	52.8	66.6	75.8
Foreign	51.6	61.1	69.3	55.1	65.4	75.4
Unspecified	48.4	58.0	68.0	52.6	64.6	74.1
Ireland	55.7	63.7	73.7	61.1	69.9	78.5
Germany	60.5	67.5	75.0	64.9	73.9	80.3
Italy	46.6	57.5	66.3	50.1	60.4	68.1
Austria-Hungary	46.9	54.6	62.5	47.2	56.3	65.1
Poland	45.7	52.7	60.3	45.7	54.2	62.3
Russia	48.9	57.2	62.6	50.3	59.5	67.4
Other Countries	53.7	62.6	70.7	58.9	69.0	77.0

native born and the total foreign born are not reflected in this table. The median ages at death from these diseases are even slightly lower for the foreign born than for the native born. The differences as between national groups are just what should be expected at the presumed relative age classifications of these groups.

While we should like to be able to confirm our conclusions by an accurate standardization of mortality rates as between the different groups of the foreign born, all of these figures point to the conclusion that there is no difference in rates from cancer and heart disease which cannot be accounted for by differences in the age composition of these national groups. These diseases, and perhaps all diseases of advanced life, appear to know no distinction between native and foreign, German or Italian, Irish or Hungarian. Any assertion of a greater or less susceptibility to disease in any group of the population needs to be supported by something more than crude rates.

The Woman Physician

NO group can so effectively, so humanly, meet the growing demand for health direction as the woman physician. I believe she is naturally better equipped to specialize in this line than the man of our profession. It has always been the woman who has cared for the health of her family; it was always the woman in the early communities, before the days of the doctor and nurse, who served her neighbors with natural, simple remedies, and it has been my observation that women have more interest in the constructive things of life than in the destructive. Perhaps the basis of this is biological. At any rate you and I have these desirable and necessary qualities of our sex in addition to our training as physicians to apply to furthering this new interest in health. The combination should make us lead out in this movement. Whether we become health specialists, or include the health practice with our present practice, there is still one more thing we may do, and that is, never let an opportunity pass of making clear the difference between the strictly medical, the protective and the preventive examinations on the one hand and the health examination on the other; and also by never letting a chance go by to stress the fact that a health examination automatically necessitates a health prescription leading to a specific goal of health positive. When we can get both the lay and the professional to come to a like understanding on these points, then health positive will have become a fact, a recognizable and accepted asset of human welfare. Lenna L. Meanes, M.D., "The Health Examination and its Goal"—An address read before the New York City Medical Woman's Association at the New York Academy of Medicine, *Med. Woman's J.*, 36, 7: 169 (July), 1929.

Two Milk-borne Septic Sore Throat Epidemics

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TWO milk-borne epidemics of septic sore throat developed in New York State between February 1 and April 1, 1929, under circumstances which in several respects were similar. Both were explosive in character and occurred in rural villages—in Wayland, Steuben County, with a population of 1,767, and Savannah, Wayne County, with a population of 612; each was traced to raw milk from a herd in which a case of mastitis was discovered; and there were cases of sore throat on both farms, in one instance previous to the discovery of the mastitis, and in the other subsequent to its discovery.

THE WAYLAND OUTBREAK

There were 141 known cases at Wayland, nearly all developing February 16 and 17, with the last on the 18th. All those investigated had used raw milk from the G. H. dairy, which sells approximately 128 quarts of raw milk daily to 120 families, out of a total for the village of approximately 700 quarts.

About February 1 there was a case of sore throat in the G. H. family, and on the 12th the principal milker developed the condition, apparently continuing to milk. There were no cases among patrons in the interval. On February 16 and 17, when most of the victims were having their onsets, Mr. and Mrs. G. H. developed the disease. On February 14 mastitis, involving one quarter, was discovered in a cow. As nearly as could be determined the milk from this cow was excluded until the 16th, was included on the 16th, 17th and morning of the 18th, and then permanently excluded. Table I gives the chronological relationship.

The epidemic first came to light on February 18 when the proprietor of a local chair factory reported that 40 employees were off duty on account of illness associated with sore throat. This factory obtained 80 pint bottles of milk from the G. H. farm daily, and investigation revealed that all of the employees who were ill had used the milk. In one family 3 persons who had used G. H. milk were ill, while 1 who used no milk, and a baby receiving only boiled milk,

TABLE I

WAYLAND

Feb. 1	2–11 inclusive	12	13	14	15	16	17	18
Case on G. H. farm		Onset of case of principal milker		Mastitis discovered		*Cases developed* among patrons; most of them on 16th and 17th		
				Milk from cow with mastitis excluded		*Milk included* 16th, 17th and morning of 18th		Definitely excluded on the 18th

escaped. In another family 2 children who received only boiled milk escaped, while 2 adults using G. H. milk raw were ill. In 2 cases it was determined with practical certainty that the milk responsible for the infection was consumed on the afternoon and evening of Saturday, February 16, and that the first symptoms of illness appeared early the following morning. Peritonsillar abscesses and adenitis complicated several cases, and death occurred in 1 case complicated by facial erysipelas.

The county laboratory on February 20 examined a milk sample from the infected quarter of the cow with mastitis. It was " thick and yellow and contained a great number of pus cells " and " short chain " streptococci. Tests were not made for hemolysis. Subsequently the state laboratory received " about 3 c.c. of slightly brownish thin milk " from the infected quarter, and, although there were many pus cells and bacteria, no hemolytic streptococci were found. The predominating organism was a streptococcus producing methemoglobin. At the same time throat cultures from a number of convalescent patients including the proprietor of the G. H. dairy were examined and found to contain hemolytic streptococci, believed to be of the type usually associated with human infections of this character.

THE SAVANNAH OUTBREAK

At Savannah there were approximately 75 cases, between March 10 and 18, most of them between the 10th and 13th, the " peak " occurring on the 12th, and the last cases, except 2 contact infections, developing on the 18th. All of those investigated had used raw milk from the W. H. dairy. The proprietor is the only dealer—aside from a few people selling surplus milk from one cow—and distributes between 100 and 200 quarts of raw milk daily. Three members of the W. H. household were ill, but not until March 12. No evidence could be obtained of the occurrence of sore throat on the farm previously.

One cow in the herd sustained an injury to one teat about March 2, which prevented the use of the milking machine, but the other three

quarters were milked by hand. A veterinarian examined the cow on the 6th and stated that at that time he found no evidence of mastitis. Swelling was said to have been discovered first on March 13, but milk from the unaffected three quarters appears to have been included until the 15th, when the dairy was visited by representatives of the State Department of Health, and the cow segregated. At that time the animal was obviously ill.

The epidemiological evidence connecting the W. H. milk with the epidemic was conclusive, as in Wayland. In one family a child who received the milk at school was ill, while no cases occurred among other members of the family who used other milk only. In another family 2 adults who used the W. H. milk on cereal were ill, while 2 children who had no milk escaped. Several cases were complicated by abscesses and adenitis, and there was 1 death directly or indirectly attributable to the epidemic.

TABLE II

SAVANNAH

Mar. 2	6	7–9	10–11	12	13	14	15	16–18
				Case developed among patrons				
Cow's teat injured	Cow examined by veterinarian. No evidence of mastitis			Peak of epidemic onset of 3 cases on farm	Mastitis discovered			
	Milk from injured cow included				*Milk from* affected quarter said to have been excluded		*All milk* excluded	

Dr. Hervey reported the following interesting and significant instance of infection. The veterinarian, who lives in an adjoining village and had used no milk from the W. H. dairy, visited the dairy with representatives of the State Health Department on March 15. In the course of an examination of the cow with mastitis he drew material from the infected quarter, for visual examination, into the palm of one hand; then with this hand he drew milk from an apparently unaffected quarter into the other hand and tasted it " to see if it was salty." Two days later he developed a sore throat. Cultures submitted for laboratory examination were found to contain hemolytic streptococci.

Dr. Breed and members of the staff of the state laboratory isolated these organisms from milk from the affected quarter of the cow with mastitis. Throat cultures submitted to the state laboratory from a number of the patients were also found to contain hemolytic streptococci. This laboratory has reported that the organisms from the milk and from representative cases corresponded as to morphological and

cultural characteristics, and biochemical reactions, and apparently were of the type usually associated with human infections of this character.

RELATION OF MASTITIS TO THE EPIDEMICS

The most interesting question in connection with these outbreaks is the relationship, if any, between the cases of mastitis and the epidemics. At Wayland failure to find hemolytic streptococci in material from the infected udder leaves a " missing link " in the chain of evidence, since the material was not received and examined at the state laboratory until March 11, over 3 weeks after discovery of the mastitis. The possibility of these organisms having been present earlier must be considered. It will be recalled that the infected udder was discovered on the 14th, and the milk excluded until the 16th; it then apparently was included again until the 18th, when it was definitely excluded. All of the cases developed between the 16th and the 18th. If the mastitis was responsible, even in view of the 12-hour incubation period cited in 2 of the cases, the termination of the epidemic on the 18th can only be explained on the assumption that hemolytic streptococci were previously present, but had disappeared or were in very small numbers in the milk which was being included on the 17th and morning of the 18th. Recalling that the principal milker became ill on the 12th and continued to milk, the alternative explanation is that on the 14th or 15th, or both, the milk handled by him was grossly contaminated, probably through coughing or sneezing.

Basing judgment on information now at hand concerning the Savannah epidemic, the evidence incriminating the mastitis is convincing. Hemolytic streptococci, apparently of the same type, were isolated from material from the infected udder and from throat cultures. When the mastitis was discovered on the 13th it was well developed and probably had existed for several days. Allowing a 2-day incubation period, the cases with onsets on the 10th would have received their infections on the 8th and it is not unreasonable to assume that virulent organisms were then being discharged, especially in view of the history of previous injury. The milk from the affected quarter was excluded from the 13th but that from the other three quarters included. The opportunity for contamination by the milker was undoubtedly sufficient to account for the comparatively few cases which developed between the 15th and 18th.

NOTE: This report is based upon data furnished by John A. Conway, M.D., District State Health Officer, and A. E. Richmond, M.D., local health officer, who investigated the Wayland epidemic, C. R. Hervey, M.D., District State Health Officer, W. H. Sweeting, M.D., local health officer, and Robert S. Breed, Ph.D., Consultant in Dairy Sanitation, who investigated the Savannah epidemic, and on preliminary reports from the state laboratory. Both Dr. Breed and the state laboratory are, at the time of writing, engaged in further bacteriological studies.

Training and Personnel*

THE following tables similar to those presented in previous years include the data concerning students registered in schools of public health, and the public health degrees granted in the calendar year 1928.

The central office of the Association has collected certain data in an attempt to determine what happens to students after they are graduated from schools of public health. Through the courtesy of the Executive Secretary the information obtained is presented herewith. Twenty schools were questioned but only 15 were able to give sufficient information for tabulation. From 1921 to 1925 inclusive these 15 schools granted degrees to 56 women and 282 men.

Of the 338 graduates listed, information regarding 133 was missing or was insufficient to tabulate. The subsequent careers of the remaining 205 graduates are listed in Table IV.

Although the classification of occupations is general, the data are of some interest. It will be noted that 133 individuals out of 338 have practically disappeared from the field of public health. Data regarding scholarship or fellowship grants are not available from all schools. The reports indicate that at least 150 of these students held scholarships or fellowships. An appreciable number of the individuals holding fellowships were foreign students.

The following tentative statement of desirable minimum training requirements for all public health workers expresses the opinion of the committee. It is here presented for further consideration, and by vote of the committee each section representative has been requested to submit the statement to his section with the request that said section prepare a statement of the desirable further training requirements for the field of public health work in question.

MINIMUM BASIC TRAINING FOR THOSE WHO ANTICIPATE ENTERING THE PUBLIC HEALTH PROFESSION NO MATTER WHAT THE SPECIALTY MAY BE:

I. General College Training

The general college training or its equivalent should include courses in general inorganic and organic chemistry, physics, zoölogy (general biology), and, if possible, also psychology, sociology and civics.

* Report of the Committee presented at a Dinner Session of the American Public Health Association at the Fifty-seventh Annual Meeting, Chicago, Ill., October 17, 1928.

II. Instruction Directly Related to Public Health

No suggestion is here made as to specific courses, which may be combined or subdivided in various ways at various institutions. The characteristic viewpoints of these 5 fields should, however, be represented.

1. *Physiology and Personal Hygiene*—The structure and functions of the human body and the various factors essential in building up and maintaining it in a sound, vigorous and harmonious state. Its relation to air, sunlight, water, food, shelter, exercise, rest, poisons and injury should be given due consideration. The prevention and correction of defects, periodic health examinations and mental hygiene should have their proper emphasis.

2. *Bacteriology and its Application to Public Health*—It is desirable that some reference to both sanitary and medical bacteriology be included. Data should somewhere be presented as to the nature, source and methods of the transmission of communicable diseases and their control.

3. *Public Health Engineering*—The engineer's angle of approach to the problems of water supply, waste disposal, air conditioning and milk sanitation.

4. *Vital Statistics and Epidemiology*—Fundamentals of sound elementary statistical procedures and the statistical methods employed in studying the incidence of epidemic and other diseases.

5. *Community Health Practices and Education*—The social and psychological problems involved in health organization, sound civic administration and the formation of public opinion.

All lecture courses should be supplemented by appropriate laboratory or field work.

The foregoing fundamental training should prove to be an excellent foundation upon which specialization in the various fields of public health may be built.

Training indicated under I may be secured in any college.

Training indicated under II may be secured in many colleges.

SUB-COMMITTEES AND SECTION REPRESENTATIVES

In order to strengthen its working efficiency the committee hereby empowers the appointment of sub-committees by the chairman, as occasion arises, for the pursuance of special pieces of work and the committee requests the sections of the Association to appoint section representatives on this committee for 2-year periods instead of 1-year as in the past.

RECOMMENDATIONS

The committee is of the opinion that the accumulation of data amounting to a stock taking of the training and professional status of public health workers in the United States is desirable. It is a necessary step for the committee to formulate definite recommendations for the future training, tenure of office and economic return for public health workers. In line with the report of the special sub-committee which has been studying this problem we believe that:

1. A comprehensive survey should be made of the institutional facilities and procedures now in use in the training of individuals ultimately intending to enter the professional field of public health work. The collection of such material by mail is inadequate and unsafe, since so many of the advantages or objectionable characteristics of the procedures do not appear in second-hand exchange of information by letter writing.

2. A careful and first-hand study should be made concerning the variety of extension courses now carried on by federal, state, and municipal public health

TABLE I

NUMBER OF STUDENTS ENROLLED AND PUBLIC HEALTH DEGREES CONFERRED IN 1928 IN COURSES REQUIRING AT LEAST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC HEALTH CAREER

School	*Degree*	*No. Enrolled 1927–1928*	*No. of Degrees Conferred 1928*
University of California	A.B.	12	3
	Dr.P.H.	0	0
	Ph.D.	1	1
	M.A.	0	0
University of Chicago	Ph.D.	0	7
Delamar Institute of Public Health, Columbia University	M.S.	1	0
Detroit College of Medicine and Surgery	Dr.P.H.	0	0
University of Georgia	S.B.P.H.	1	1
	M.S.P.H.	3	3
	Dr.P.H.	3	3
Harvard School of Public Health	Dr.P.H.	3	1
	M.P.H.	4	4
	C.P.H.	6	6
Johns Hopkins School of Hygiene	Dr.P.H.	11	9
	Sc.D.	39	10
	C.P.H.	26	20
Massachusetts Institute of Technology	S.B. in P.H.	37	5
	C.P.H.	3	0
	Dr.P.H.	1	1
	Ph.D.	8	2
McGill University	D.P.H.	2	2
	B.Sc.	9	0
University of Michigan	Dr.P.H.	8	0
	M.S.	4	4
University of Minnesota	M.A.	1	0
	B.A.	1	0
University of Montreal	D.P.H.	0	0
Ohio State University	M.S.	4	2
University of Pennsylvania	Ph.D.	3	1
	Dr.P.H.	0	0
	M.A.	1	1
	M.S.	2	2
Queen's University	D.P.H.	0	0
University of Toronto	D.P.H.	7	5
	Ph.D.	2	0
	M.A.	2	2
University of Western Ontario	D.P.H.	0	0
Yale University School of Medicine	C.P.H.	7	4
	Dr.P.H.	0	0
	Ph.D.	9	3
	M.S.	7	1
Total		228	103

TABLE II

NUMBER OF DEGREES IN PUBLIC HEALTH GRANTED IN UNITED STATES AND CANADA IN 1928

Degree	*Degrees Granted*	*Schools Offering the Degree*
C.P.H.	30	4
D.P.H.	7	5
Dr.P.H.	14	9
Ph.D.	14	6
M.S. in P.H.	12	6
Sc.D.	10	1
S.B. in P.H.	6	3
M.P.H.	4	1
A.B.	3	2
M.A.	3	3
B.Sc.	0	1
Total	103	

agencies, universities, voluntary agencies, or any of these jointly, in order to acquaint the committee with the progress that has been made in supplementing the professional activities of public health workers by extramural training courses. Many in public health work are of the opinion that such extension courses made available to active workers are more effective developers of initiative and efficiency than the ordinary full-time university courses. Examples have been noted in the literature of the great value of such courses in various cities and universities. A review of such undertakings is likely to be instructive.

3. The present status of salary standards, permanence of tenure, and mode of selection of workers should be reviewed. Here again field investigation is essential, particularly with reference to permanence of tenure and mode of selection of workers, since the political, psychological, and other controlling factors in this situation are, and will continue to be, of great importance in the attempt to raise the general level of professional public health work.

4. A survey should be made of the nature, quantity, and quality of previous training of the public health workers now in active practice.

5. The use and abuse of legislative and civil service restrictions in the selection and dismissal of public health workers are matters of considerable interest. These regulations and restrictions should be carefully reviewed and tabulated, in order to determine their advantage, obsolescence, and danger. The lay public must be educated to the inherent objections or advantages in the present variety of laws and civil service requirements. Some of these requirements are helpful, others harmless,

TABLE III

PUBLIC HEALTH DEGREES CONFERRED 1921–1925

	Male	*Female*
Certificate in Public Health	57	8
Doctor of Public Health	147	4
Doctor of Science in Hygiene	20	15
Doctor of Philosophy—Public Health	9	6
Master of Science in Public Health	28	6
Master of Public Health	5	
Master of Arts in Hygiene	0	2
Bachelor of Public Health	16	15
	282	56

TABLE IV

POSITIONS HELD BY 205 GRADUATES

Teaching	76
City Department of Health	27
Laboratory Work	25
Health Officers	21
State Department of Health	17
Private Practice	11
Volunteer Agencies	9
U. S. Public Health Service	10
Bureau of Fisheries	3
United States Army	3
Editors	2
League of Nations	1
	205

and still others have proved their usefulness, primarily in affording opportunities for political interference in the appointment and dismissal of public health workers. The committee could perform an exceedingly helpful public duty by analyzing this situation in the country at large, by pointing out the demerits wherever found and ultimately by formulating recommended procedures of legislative and civil service regulation.

6. Considerable discussion arises at every session dealing with the training of public health workers as to whether or not existing medical schools contribute much or little to the instruction in preventive medicine of medical students. The content of, and the allotment of time to, the public health courses in medical schools should be the subject of further study and report.

It is recommended that this committee establish a budget and, with the aid of the administrative office of the Association, seek special funds for the employment of a part-time or full-time worker with sufficient allotment for travel expenses to perform the duties noted above and to report in detail and in writing to the Committee on Training and Personnel on the results of the study.

SALARY STANDARDS

It is the belief of this committee that the report on salary standardization made to the Association in 1922 is now in need of revision in respect to both facts and recommendations. This committee desires to undertake a revision of that report and requests the Association to approve the setting up of a budget for the purpose, the amount of said budget to be determined by the Executive Board and the work to be done in connection with the more extensive study outlined above or as a separate investigation.

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Local Immunization and Antivirus

NEWTON W. LARKUM, PH. D.

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LOCAL immunization by means of antivirus has received relatively little attention in the medical literature of the United States. It would appear that this situation has resulted partly from a lack of faith in the reports printed in foreign journals, and partly to a lack of familiarity with such publications. Consequently it would seem advisable in a public health periodical to review the subject briefly, and to state what appears to be the present status of this method of immunization. Such a discussion must include two quite separate and distinct discoveries—one, local immunization, a conception that since in a given infection a certain tissue is primarily affected, immunization of that tissue should prevent the infection; the other, that a certain substance, "antivirus" (Besredka), contained in filtrates of old broth cultures of bacteria is the principle which can best produce this local immunity. Such antivirus is specific, and when used in the treatment of staphylococcus infections should be prepared at the expense of staphylococci.

The idea of local immunity was originated by Besredka and is fully presented in *Local Immunization*.[1] Every pathogenic bacterium is virulent for a certain tissue according to this author. Thus, the typhoid, paratyphoid and dysentery bacilli and the cholera vibrio primarily attack the mucosa of the small intestine. The anthrax bacillus is a saprophyte except in the cutaneous tissue. The staphylococcus and certain types of streptococci select the skin for their attack. Immunize these tissues and the infection cannot occur.

According to Besredka's own confession, the idea of local immunity had its genesis in a study of immunity to anthrax in guinea pigs. Ordinarily, these animals are most susceptible to this infection, yet when they were inoculated with many times the lethal quantity of anthrax bacilli in such a manner as to avoid injury to the skin or contact of bacilli with the skin, they resisted the invasion, in fact gave no symptoms whatsoever. They acquired no immunity as the result of inoculations of this type. If, however, the skin was vaccinated either by intracutaneous inoculation or by direct application of the vaccine,

the animal became immune to anthrax infection. Such an immunity was not accompanied by the presence of demonstrable antibodies, nor was it possible to immunize passively a second animal by means of a serum from a completely immunized guinea pig. There is at present little tendency to dispute these observations. In so far as anthrax is concerned, the fundamental observations have been repeatedly confirmed not alone with guinea pigs but with rabbits. The principle of "cuti-immunization" has been applied to the protection of large animals on a broad scale and in so far as may be judged by the reports available has been eminently successful.

Although not the only tissue susceptible to the attack of staphylococci and streptococci, the skin is particularly subject to infection. It may be said that these cocci have a predilection for such tissue. Consequently it was not long after the establishment of anthrax immunization by means of intracutaneous inoculation that Besredka and others attempted similar work with the pyogenic cocci. They succeeded. In animal experiments they were able to confer a very high degree of immunity by intracutaneous inoculation of killed cultures, or by application of dressings soaked in such material or soaked in filtrates of old cultures of these organisms. The success attending these experiments was not so complete as that attending anthrax immunization; yet it was considerable and sufficient to warrant the application of the method to treatment of such infections in man.

In dysentery and typhoid fever the mucosa of the small intestine is the susceptible tissue. If the organisms causing these diseases are introduced into animals by any route they will localize in this tissue. Further, by rendering such tissue more permeable through damage such as may be produced by bile, animals ordinarily immune may be made to undergo a typical typhoid or dysentery infection. Conversely, a very considerable immunity may be conferred by introduction of killed cultures into the small intestine, which preferably has been previously prepared by ingestion of a small amount of bile. Again these findings have been carried over to human application with results sufficiently striking to warrant further investigation.

Although not described in Besredka's monograph, his method of immunization has been applied to many other infections, and has become in addition a method of treatment. Tuberculosis and gonorrhea in particular have been the subject of extensive investigation. Like all problems involving treatment of man, there is required too much of detail and of control to make evaluation possible at the present time.

So much of Besredka's monograph as depends upon observed phenomena is not difficult to accept, especially in view of the ample sup-

port it has received. That part of his work bearing upon an explanation of these phenomena is less easily digested. As in the case of bacteriophage, the consideration of underlying causes bids fair to overshadow the very practical accomplishments. This is unquestionably necessary, for it is inconceivable that a therapeutic measure could come into general use without a rational basis for its acceptance. The greatest difficulty seems to concern the denial of antibodies in the immunity produced. This is, for many, a pill hard to swallow.

No brief summary can do justice to Besredka's ideas, but some suggestion of his method of reasoning may challenge a more intensive study of the theory. According to this author, immunity is largely dependent upon phagocytosis. Providing that leucocytes can be brought into contact with bacteria, phagocytosis occurs. The idea of *positive* chemotaxis Besredka rejects. Except in the presence of negative chemotaxis it is the normal function of phagocytes to approach, surround, ingest and if possible to digest foreign bodies. When a tissue is susceptible to invasion by a given organism it possesses receptors which Besredka thinks may reside in some of the reticuloendothelial cells in that tissue. These receptors in conjunction with the invading organisms produce a state of *negative* chemotaxis which prevents phagocytosis and allows the establishment of infection. Contact of the susceptible tissue with the organism, rendered noninvasive, exhausts these receptors and hence provides for immunity by making possible immediate phagocytosis upon invasion by viable organisms. The exhaustion of the receptors depends not upon the bacterial antigen but upon a substance associated with bacteria. It is present in small quantities in heat killed vaccines but is much more abundant in filtrates of old cultures. This substance Besredka calls antivirus. Hence it has come about that the terms antivirus and local immunization are practically inseparable.

No one reading Besredka's monograph or the abundant literature upon the subject can help believe that as a method, local immunization has much to recommend it. One is likely to feel equally impressed with the weakness of the theory which supports it. This fact should lead to intensive investigation either to strengthen the theory or to provide another having fewer weaknesses. French, German, and Italian investigators have attacked this problem. The literature in the English language is practically nil. It is difficult to state what is needed to bring this problem to the attention of investigators in this country. The question is so dependent upon a combined clinical and laboratory investigation that it requires a united attack by physicians and laboratory investigators such as can best be provided by a sub-

sidized group. In view of the magnitude of the problem it is not too much to hope that America will not long remain in almost complete ignorance of this subject.

REFERENCE

1. Besredka, *Local Immunization* (English translation), Williams & Wilkins, 1927.

Enemies of Knowledge

ONE last word. It is possible to hold strong opinions and still to be tolerant. We must have theories, and we may believe them very implicitly, if we are to progress. A sheer accumulation of facts will gradually overwhelm the human brain, if no means of ordering them be available. We must, however, continually reflect upon the possibility that after all we may be wrong. So long as we do nothing unfair to other people and their theories, so long as we do not interfere with their liberties in the pursuit of their lawful business, our own strong beliefs, our own stupidity and ignorance, may be forgiven.

Inside the front page of a recent book on physical astronomy a friend of mine has pasted a cartoon of a young lady talking to an old fisherman: "What did you think," she says, "of last night's wireless lecture on the atom?" "Never heard such a pack of lies in my life." That, however, is not the same thing as intolerance; no old fisherman would wish to burn, to imprison, or even to pray for the deaths of Professor Eddington and Sir James Jeans. I do not much care if the Countess of X, or her friends in the Government, take the same cheerful view that the results of medical research are a "pack of lies." That is her business, and, after all, I probably have the same contempt for many of her sacred beliefs. I am content to leave the decision between us in such matters to the public intelligence. What I do protest against, and would fight against with all my strength, are calumnies and persecution, and attempts at legal interference with our liberties, wantonly intended to hinder the advance of knowledge; or national and political hatreds which prevent coöperation in the greatest of human quests; or theories, however well grounded, which their owners cannot conceive as being otherwise than true. In such matters, after all, modesty, friendliness, humanity, judgment, balanced by a reasonable sense of humour, are, as in other things, the basis of human welfare.—A. V. Hill. From *The Lancet*, June 29, 1929, p. 1388.

EDITORIAL SECTION

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LABORATORY STUDIES OF YELLOW FEVER

MORE than two years have elapsed since the discovery that the *Macacus rhesus* monkey may be inoculated successfully with yellow fever. The finding of a suitable laboratory animal opened a new era of research in yellow fever, and the work published so far has not only confirmed the essential findings of the Army Yellow Fever Commission under Walter Reed, but has also made a considerable addition to new knowledge.

The discovery that yellow fever is transmissible from man to monkey was made by Stokes, Bauer, and Hudson[1] of the West African Yellow Fever Commission of the Rockefeller Foundation. It was confirmed in Senegal by Mathis, Sellards, and Laigret,[2] and later in Brazil by Aragão.[3] The virus soon became available for study in Europe and America, as Sellards[4] was able to transport it in frozen monkey liver from Senegal to England, and from there to the United States. Later it was sent successfully from Nigeria direct to the United States under various methods of preservation. Up to the present, yellow fever virus from West Africa has been studied, through the use of monkeys, in Lagos, Accra, Dakar, London, Paris, Berlin, Amsterdam, Rio de Janeiro, Bahia, Boston, and New York, and the virus from South America has been similarly investigated in Rio de Janeiro, Bahia, and New York. The methods of preservation of the virus for storage or for shipment between laboratories have been improved step by step until it is now possible, according to Sawyer, Lloyd, and Kitchen,[5] to desiccate blood-virus in the frozen state and keep it in sealed tubes for at least 150 days.

One of the great needs in yellow fever control operations and in the preliminary epidemiological studies is a specific diagnostic test by

which the mild and recovered cases can be identified and the endemic areas ascertained. As yet no simple and inexpensive test has been found, but it is possible, by the use of monkeys, to determine whether a person has had yellow fever. The serum from a recovered patient, when injected in suitable amounts, will protect a susceptible monkey against a subsequent inoculation of the virus.

The monkey commonly used is the *Macacus rhesus* from Asia, but several other species of the same genus are susceptible, and Davis and Shannon[8] have found that a South American monkey, *Cebus macrocephalus,* is possibly slightly susceptible. By means of such protection tests Theiler and Sellards[7] and also Hudson, Bauer, and Philip[9] have shown that the serum of persons who had recovered from yellow fever in the Western Hemisphere protected against African strains of the virus. One of the protecting serums had been taken from a person who had had yellow fever in Peru 7 years before. These experiments add to the evidence that yellow fever as found in Africa is the same disease as that found in the Americas.

Bacteriological studies of yellow fever in monkeys have, as a rule, failed to reveal any organism which could be considered the cause of yellow fever. The single outstanding exception is the announcement by Kuczynski[6] of a bacterial organism which he believes is related to the disease. The filterability of the virus in blood serum has been again demonstrated by Stokes, Bauer and Hudson[5] and the causative agent is generally considered to be one of the filterable viruses. This classification has recently been supported by the discovery by Torres[10] of intranuclear inclusions in the liver cells of monkeys which had been inoculated with Brazilian strains of yellow fever virus. These inclusions are made up of clusters of acidophilic particles and are suggestive of the intranuclear inclusions of herpes. Similar inclusions were later found by Torres[11] in monkeys inoculated with African virus. The intranuclear inclusions have been studied by Cowdry and Kitchen,[12] who found them in monkeys inoculated with an African strain of yellow fever and also in human yellow fever tissues from Africa and the Western Hemisphere. Pathological studies of the tissues of monkeys dead of yellow fever have been made by Hudson,[13] who is of the opinion that the lesions are strikingly parallel to those produced by yellow fever in man.

The virus of yellow fever is easily transmitted from monkey to monkey by the mosquito *Aëdes* (*Stegomyia*) *aegypti,* the well known transmitter of yellow fever and dengue. By the use of laboratory animals, the virus in the mosquito can be studied more closely than formerly when the work involved the use of human volunteers. The

incubation period in the insect has been found, by Bauer and Hudson,[34] to vary from 9 to 12 days, and they demonstrated also that the mosquitoes contain virus in infectious form throughout the incubation period, although their bites are then harmless.

Perhaps the most significant result of the studies of the mosquito is the finding that the common stegomyia is not the only mosquito capable of transmitting yellow fever. A number of species have been studied in Africa by Bauer,[35] and under laboratory conditions yellow fever was transmitted by the bites of the following species: *Aëdes luteocephalus, Aëdes apicoannulatus,* and *Eretmopodites chrysogaster.* It is still a matter of speculation whether any of these three species helps spread yellow fever under natural conditions.

The work of the Army Commission in Cuba and the general experience with post-mortem examinations had shown that objects contaminated by yellow fever patients and the bodies of persons dead of yellow fever are not dangerous. It appears, however, that those who work with the highly infectious blood or liver emulsion of infected animals are in great danger. Eight accidental infections with yellow fever have been reported in bacteriologists working in laboratories with the experimental disease in monkeys, and 4 have lost their lives: Adrian Stokes, Hideyo Noguchi, William A. Young, and Paul A. Lewis. The method of entry of the virus was a mystery to those infected. It was shown by Bauer and Hudson,[36] however, that the virus may infect monkeys through the intact skin, when virus-bearing monkey blood is applied. This may help explain the tragic laboratory accidents. Injections of convalescent yellow fever serum have been used in Africa as a preventive after minor accidents in the laboratory.

A safe method of active immunization against yellow fever is urgently needed to protect individuals in epidemic and endemic areas and also the persons engaged in yellow fever investigation and control. A vaccine has been prepared by Hindle[37] from cytolyzed monkey liver and spleen tissue to which 2 parts of formaldehyde per 1,000 have been added. This vaccine has protected monkeys against inoculation with yellow fever virus, and the British Colonial Office is considering giving it a trial in West Africa. In Brazil, Aragao[38] made a vaccine from monkey tissues to which phenol and formaldehyde were added. This vaccine has already been administered to many thousands of persons; but, because of the poor results obtained, its use has recently been abandoned. It will take time, therefore, to determine the degree of protection to be expected through the use of these vaccines in human beings.

The high protective power of convalescent serums of man or

monkey has led to experiments to produce even more potent serums by hyperimmunization of animals. Pettit, Stefanopoulo, and Frasey[19] have prepared potent immune serums from various animals including monkeys and horses. Unfortunately, immune serums appear to be of no avail in the treatment of yellow fever in man or monkey after symptoms are established.

The journals are constantly bringing forth the announcement of new results of yellow fever research. Each increase in knowledge should hasten the day when yellow fever control measures can be simplified, and made easier of application among primitive peoples.

REFERENCES

1. Stokes, A., Bauer, J. H., and Hudson, N. P. *Am. J. Trop. Med.*, 8: 103, 1928.
2. Mathis, C., Sellards, A. W., and Laigret, J. *Compt. rend. Acad. d. sc.*, 186: 604, 1928.
3. Aragão, H. de B. *J. A. M. A.*, 92: 550, 1929.
4. Sellards, A. W., and Hindle, E. *Brit. M. J.*, 1: 713, 1928.
5. Sawyer, W. A., Lloyd, W. D. M., and Kitchen, S. F. *J. Exper. Med.*, 50: 1, 1929.
6. Davis, N. C., and Shannon, R. C. *J. Exper. Med.*, 50: 81, 1929.
7. Theiler, M., and Sellards, A. W. *Ann. Trop. Med.*, 22: 449, 1928.
8. Hudson, N. P., Bauer, J. H., and Philip, C. B. *Am. J. Trop. Med.*, 9: 1, 1928.
9. Kuczynski, M. H., and Hohenadel, B. *Klin. Wchnschr.*, 8: 9, 58, 1929.
10. Torres, C. M. *Compt. rend. Soc. de biol.*, 99: 1344, 1928.
11. Torres, C. M. *Memoirs of the Oswaldo Cruz Inst.*, Suppl. No. 6, 1929.
12. Cowdry, E. V., and Kitchen, S. F. *Science*, 69: 252, 1929.
13. Hudson, N. P. *Am. J. Path.*, 4: 395, 407, 419, 1928.
14. Bauer, J. H., and Hudson, N. P. *J. Exper. Med.*, 48: 147, 1928.
15. Bauer, J. H. *Am. J. Trop. Med.*, 8: 261, 1928.
16. Bauer, J. H., and Hudson, N. P. *Am. J. Trop. Med.*, 8: 371, 1928.
17. Hindle, E. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 22: 405, 1929.
18. Aragão, H. de B. *Memoirs of the Oswaldo Cruz Inst.*, Suppl. No. 2, 1928.
19. Pettit, A., Stefanopoulo, G., and Frasey, V. *Compt. rend. Soc. de biol.*, 99: 541, 1928.

LEADERSHIP IN AMERICAN PUBLIC HEALTH

LEADERSHIP in American public health now rests with the southern states. Not only have they made the greatest progress in recent years in the organization of their public health services but they seem to show most promise in their readiness and ability to extend and perfect their organizations to the point of adequacy. The richer and more complacent northern and eastern areas of the country have much to learn from their sister states below Mason and Dixon's line. It is hoped that they will not lose much time in profiting from the admirable lesson.

The history of this shifting of leadership to the southern states is full of interest. Massachusetts was the first state to develop a public health department as we now conceive it. Under the inspiration of Shattuck, Walcott, Bowditch, Abbott, and later Professor Sedgwick, Massachusetts showed the way to the rest of the country. New Jersey, Michigan and New York early did sanitary work of a high order, and New York State especially reached an enviable position later through the constructive genius of Hermann M. Biggs. But while these and other northern states were perfecting their centralized or-

ganizations, a new development began in the South. The surface of public health effort had barely been scratched in this large area of the country. Health problems of the first order called for attention. Under able guidance and the coöperation of state and federal health officials, a host of local health activities began to spring up. The keynote of this work was the perfection of local units of rural health service. Their plan called for decentralization rather than the perfection of the state health office.

From the very beginning, the International Health Board of the Rockefeller Foundation aided the organization of well conceived local full-time services in a number of states by contributing funds and the services of its staff. Primarily concerned with the control of hookworm disease, these local health units later were strengthened and took on the other functions of a well organized health agency. North Carolina did pioneer work in this field; later Alabama and Mississippi and, more recently, Tennessee, have perfected organizations approaching a state-wide basis of full-time county health units. Virginia, Kentucky, Louisiana, South Carolina, Georgia, Arkansas, Maryland and Missouri have taken up the program.

To facilitate the manning of local units with competent personnel, thriving stations for the training and appraisal of health officers, sanitary inspectors, and nurses are to be found in a number of states. Today, we find in the South a vigorous and growing movement for the completion of health organization on this tried and proven basis of full-time, competent county health service. There is no part of the country where more vigorous rural health activity can be seen in operation, where money is being spent more wisely, and where better results are obtained than in the South.

It is literally true that when health observers from abroad come for the study of our best rural work, it is necessary to take them to such southern states as Mississippi and Tennessee rather than to the northern states where health work has been in operation much longer and where brilliant achievements were recorded in the past. Possibly it would be more charitable to say that health work in most northern states, being older, has reached a more or less static condition in relation to basic needs. But there is little to inspire in this situation.

It would be unfair, however, to say that the new development is entirely limited to the South. The movement for full-time county health service early made its impress in Ohio where the organization is as extensive and as effective as anywhere, but Ohio is rather an exception among the northern states. Michigan is beginning to come along.

Iowa and Wisconsin have just passed admirable permissive laws for county health service. There are indications of murmurings which presage a similar movement in other states of the North and East in the immediate future. New York has recently shown that it is possible under its law to organize on the full-time county unit plan. But there are only a few units, where 50 or 60 are possible. It would be a great gain to the whole movement if New York State could organize itself widely on the full-time county plan functioning with the traditional efficiency of this state's health department. When this happens, a new era in American health work will be ushered in.

THE IODINE CONTENT OF FOODSTUFFS

AN interesting study which has great possibilities is being carried on in South Carolina by the departments of physiology and pathology of the Medical College of the state (the field force of the State Board of Health), and several physicians.

In 1928 the legislature created a commission and provided funds for studying the mineral elements of foodstuffs growing in the state. The prime mover was Dr. William Weston, a pediatrician, whose interest was aroused through the problems of nutrition. The analyses are being done by Prof. Remington of the Medical College.

While similar data for the entire country are not available for comparison, it can be said that the vegetables grown in South Carolina contain from twenty to thirty times as much iodine as those produced in California and Oregon. An unexpected finding is that the vegetables from the Piedmont region are somewhat richer in iodine than are those grown in the coastal belt. The green leafy vegetables show the largest amounts of iodine and are also the richest in vitamins and iron. The root crops are also rich in iodine, but grains, regardless of where they are grown, are poor in this element.

It has been found that the river water which showed the highest content of iodine is some 150 miles from the coast. This particular stream did not contain other salts, which would indicate that they were derived from wind-borne spray from the sea. These findings are contrary to the former theory that iodine and other salts were obtained from the ocean through wind-blown spray. Another theory seems to have been disproved by the analyses as far as they have gone. Nitrates from Chile have been used to a considerable extent as fertilizer, and some have supposed that iodine was derived from this source. However, Chilean nitrate contains only a few hundredths of one per cent of iodine and the section of the state which shows the highest

goiter incidence and the lowest amount of iodine in the foodstuffs is that in which Chilean nitrate has been most largely used over a number of years. On the other hand, such vegetables as peas and beans, which contain large amounts of iodine, are not fertilized with nitrate.

The examination for service during the World War showed that those drafted in South Carolina had an incidence of simple goiter of 0.25 to 1.00 per 1,000. The findings, so far, indicate that in South Carolina, at any rate, the vegetables are a more important source of iodine than the water supplies.

Certain preliminary analyses indicate that those foods which are rich in iodine are also relatively rich in iron and manganese. It has already been pointed out that the vegetables which are richest in iodine are also rich in vitamins and iron.

The studies are to be continued, combined with feeding experiments. The results are interesting and important, and we hope that they will serve to broaden the investigations on endemic goiter from a study of waters, to which they have so far been largely confined, to the elements concerned in nutrition.

Epidemiology Section

THE Executive Board at its meeting, December 8, 1928, appointed officers for the Section on Epidemiology, established by the Governing Council October 18, 1928, in Chicago.

The organization of this section is intended to meet a definite need for a group of earnest public health workers who are primarily interested in the study and the practice of epidemiology, by whatever title the bureau or department to which they belong may be designated.

Fellows and members of the Association who are at present engaged in lines of work where their major interests are in this field, should designate to the Executive Secretary their desire for a connection with the Section on Epidemiology and apply for transfer. Persons interested in this field who are not now members of the Association should find in this section an outlet for their contributions to the subject, and stimulating contact with those in similar fields, in state or city departments.

Applications for transfer from other sections, and applications for membership to this section should be in the hands of the Executive Secretary of the Association well in advance of the Minneapolis meeting.

A stimulating program has been prepared for the meetings of this section, as well as for the joint meetings with the Health Officers' Section and the Laboratory Section.

DON M. GRISWOLD, *Chairman*
E. S. GODFREY, JR., *Vice-Chairman*
HAVEN EMERSON, *Secretary*

ASSOCIATION NEWS

Minneapolis Will Entertain Her Guests

MINNEAPOLIS is a convention city, not only for its new Municipal Auditorium, excellent hotel accommodations, accessibility by rail, airplane, or motor car, but also because of its great educational institutions, the large measure of health consciousness among its people, its natural beauty, remarkable scenic development, and its hospitality toward its visiting guests.

The American Public Health Association, the American Child Health Association, the International Society of Medical Health Officers, the American Social Hygiene Association, the American Association of School Physicians, the Conference of State Sanitary Engineers, and the State Laboratory Directors are among the guests Minneapolis delights to honor.

It is happy to be assisted in their entertainment by the State Sanitary Conference, the Minnesota State Public Health Association, and the State Nursing Organizations. With this unique occasion it will associate the third annual session of the Northwest Conference for Child Health and Parent Education, and, finally, under the joint auspices of the American Public Health Association, and the Northwest Conference, the first Educational Health Exhibit for the benefit of the people at large will be presented. A prospectus of the Exhibit will be issued soon.

Entertainments and Trips

1. The health organizations are invited to join the University of Minnesota in the Dedication of the Public Health Pavilion upon the Medical Campus on Tuesday, October 1, 1929, at 9:00 A.M. The program follows:

   a. Welcoming Address, by Dr. Lotus Delta Coffman, Chancellor of the University of Minnesota
   b. Dedicatory Address, " The Doctor, the Health Officer, and the Community," by Dr. C.-E. A. Winslow, Director of the Anna M. R. Lauder Department of Public Health, Yale University
   c. An Address upon " The Evolution of Student Health Services," by Dr. Harold S. Diehl, Director of the Minnesota Service and Chief of the Department of Preventive Medicine and Public Health
   d. An Address upon " The University in Relation to Public Health Work," speaker to be announced later

The program will be followed by a complimentary luncheon in the Ball Room of the Minnesota Union.

2. A drive will be arranged through the immediately surrounding lake district to the Glen Lake Sanatorium and the Children's Preventorium for Tuberculosis, an institution of 660 beds. Buffet Luncheon will be served.

3. A drive to the University of Minnesota Main Campus and the Agricultural Campus—the fourth university in point of registration in the United States.

4. A trip to the hospitals and educational institutions of the Twin Cities for the care and rehabilitation of the handicapped, including the Minnesota Hospital for Crippled Children, the Shriners' Hospital, the Arthur J. Gillette State

Hospital for Crippled Children and the Michael Dowling School.

5. A visit to the Citizens' Aid Building, the unique home of the social and health agencies of the city.

6. A visit to the University Medical Schools, and the University Hospitals, including the Cancer Institute, the Frank C. Todd Memorial Clinic and the Eustis Hospital.

7. A trip for the sanitary engineers and State Sanitary Officers to the water filtration plants and to the proposed sites for river purification plants.

8. A trip to the milk producing, pasteurizing and distributing plants.

9. A trip to the Minneapolis flour mills.

10. Two alternative drives for visiting ladies:

a. To Lake Minnetonka and intervening lakes and boulevards, ending up with an afternoon tea at the Minneapolis Art Institute

b. Around the lakes and boulevards surrounding the city, to the Falls of Minnehaha, returning by the River Roads and the Victory Drive, ending up with an afternoon tea proffered by the Minnesota State Organization for Public Health Nursing at the Minneapolis Woman's Club

11. A trip to the hospitals and public institutions of Saint Paul, to be offered by the profession and the citizens of the city's twin, is suggested.

12. At the Opening General Session of the Visiting Health Organizations, on Monday evening, September 30, a dance will be given by the Local Committee at the Hotel Nicollet.

13. The Minnesota State Public Health Association will arrange a dinner at the Hotel Nicollet, on Tuesday evening, October 1, to be followed by an interesting program of speakers and musical entertainment (Tickets, $2.00).

14. The Annual Banquet of the American Public Health Association and its allied organizations will be held on Thursday evening, October 3, in the Grand Ball Room of the Hotel Nicollet (Tickets, $2.50). At the after-dinner program, Dr. George Edgar Vincent, President of the Rockefeller Foundation, will make the opening Address. Other speakers will be announced. The banquet and program will be followed by a dance given by the Local Committee.

15. A special trip, by fast railway service, to the Mayo Clinic and the Mayo Foundation, Rochester, Minn., will be provided late on Friday evening, October 4; leaving Minneapolis at 9:40 P.M. A research health program will be presented for Saturday morning, October 5. Visits to hospital clinics will be arranged.

A complimentary luncheon will be arranged for Saturday noon, followed by an informal program, and an early afternoon visit to the Saint Mary's and the Kahler Corporation Hospitals.

Trains will leave Rochester for Minneapolis at 4:00 P.M., and for Chicago at 9:30 P.M. on Saturday.

The guests of Minneapolis for the public health meetings will greatly facilitate the work of the Local Committee if they will make *advance reservations* (1) for the University Dedication Exercises and Luncheon on Tuesday morning; (2) for the Minnesota State Public Health Association dinner on Tuesday evening; (3) for the Annual Banquet on Thursday, October 3; and (4) for the Mayo Visit and luncheon. Its officers will be gratified if reservations are also made, so far as possible, in advance, for other entertainments and trips.

Address: Richard Olding Beard, M.D., Executive Secretary for the Local Committee, 324 Citizens' Aid Building, Minneapolis, Minn.

Sedgwick Memorial Medal

SEDGWICK MEMORIAL MEDAL
AWARDED TO
BY THE AMERICAN PUBLIC HEALTH ASSOCIATION FOR DISTINGUISHED SERVICE IN PUBLIC HEALTH

THE Sedgwick Memorial Medal Committee has accepted a design for the Sedgwick Memorial Medal prepared by Mary Hooker Donelson. This design was selected as the prize winning design in a contest arranged by Professor E. O. Jordan in coöperation with M. J. Rosenau, M.D., and Robert Spurr Weston.

This medal is given in memory of the late Professor William T. Sedgwick, who was President of the American Public Health Association in 1915. It was made possible by a contribution of funds by Professor Sedgwick's friends and former students. The medal is to be awarded for distinguished service in public health work, the winner of the award to be selected by the Sedgwick Memorial Medal Committee of the American Public Health Association, from candidates who have been nominated for this purpose.

It is expected that the first award of the medal will be made at the 58th Annual Meeting of the Association at Minneapolis, Minn., during the week of September 30. Nominations should be addressed to the Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

EVA F. MACDOUGALL NEW EDITOR

Since the February, 1927, issue of the JOURNAL, Miriam Ames, R.N., Assistant Director, Visiting Nurse Service, John Hancock Life Insurance Company, has edited the Public Health Nursing Section. Recently, however, because of the pressure of her work with that company, Miss Ames has found it impossible to continue her work for the Journal.

Eva F. MacDougall, R.N., Director of the Division of Public Health Nursing, Indiana State Board of Health, has been appointed editor of the Public Health Nursing Section in Miss Ames' place, and begins her contributions with the present issue.

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received 15 days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Minneapolis will be elected for the three-year term, 1929–1932.

T. B. Beatty, M.D.,
State Health Commissioner,
Salt Lake City, Utah

E. L. Bishop, M.D.,
State Health Commissioner,
Nashville, Tenn.

A. J. Douglas, M.D.,
City Health Department,
Winnipeg, Man.

William A. Evans, M.D.
Chicago Tribune,
Chicago, Ill.

I. S. Falk, Ph.D.,
Department of Hygiene and Bacteriology,
University of Chicago, Chicago, Ill.

John A. Ferrell, M.D.,
International Health Division,
New York, N. Y.

Prof. J. G. Fitzgerald,
Connaught Laboratories,
University of Toronto, Toronto, Ont.

A. H. Flickwir, M.D.,
Health Officer,
Fort Worth, Tex.

W. H. Frost, M.D.,
Johns Hopkins University,
Baltimore, Md.

J. C. Geiger, M.D.,
University of California Medical School,
Hooper Foundation, San Francisco, Calif.

Don M. Griswold, M.D.,
Deputy Health Commissioner,
State Dept. of Health, Springfield, Ill.

Prof. Ira V. Hiscock,
Department of Public Health,
Yale University, New Haven, Conn.

Thomas G. Hull, Ph.D.,
Diagnostic Laboratory,
Department of Health,
Springfield, Ill.

John F. Norton, Ph.D.,
Department of Health Laboratory,
Herman Kiefer Hospital,
Detroit, Mich.

H. L. Rockwood, M.D.,
Health Commissioner,
Cleveland, O.

Clyde C. Slemons, M.D.,
Health Officer,
Grand Rapids, Mich.

H. A. Streeter, M.D.,
City Isolation Hospital,
Manchester, N. H.

Benjamin White, Ph.D.,
Antitoxin & Vaccine Laboratory,
Jamaica Plain, Mass.

Huntington Williams, M.D.,
State Department of Health,
Albany, N. Y.

Shirley W. Wynne, M.D.,
Health Commissioner,
New York, N. Y.

NOMINATING COMMITTEE

James Roberts, M.D., *Chairman*
C. C. Young, D.P.H. Abel Wolman

PHOTOGRAPHS OF PAST PRESIDENTS

There is being assembled in the Executive Office of the Association a collection of photographs of past presidents of the Association. This collection is fairly complete for recent years, but the assistance of members and Fellows of the Association is requested in filling the many gaps in this gallery. The only photographs which we have been able to secure of presidents previous to 1900 are those of the first 10 presidents, and the following:

Henry P. Walcott—1886
George M. Sternberg, M.D.—1887
Samuel H. Durgin, M.D.—1893

Subsequent to 1900 the collection is complete with the exception of the following:

Benjamin Lee, M.D.—1901
Walter Wyman, M.D.—1903
Domingo Orvananos, M.D.—1907
G. T. Swarts, M.D.—1909
R. M. Simpson, M.D.—1911
Rudolph Hering, Sc.D.—1913

Any member or Fellow of the Association who may have or have access to pictures of any of the past presidents which are not included is urged to communicate with the Executive Secretary.

NEW MEMBERS

I. Alexa, M.D., C.P.H., Iasi, Roumania, Instructor in Bacteriology (Assoc.)
James M. Brannon, Ph.D., Urbana, Ill., Dairy Bacteriologist
A. D. Brewer, M.D., Bozeman, Mont., City-County Health Officer
Ethel G. Bright, R.N., Swainsboro, Ga., Emanuel County Nurse
Eula B. Butzerin, R.N., Minneapolis, Minn., Director of Course in Public Health Nursing, University of Minnesota
Belle Carver, R.N., Brooklyn, N. Y., Industrial Nurse, United States Rubber Co.
C. A. Christensen, M.D., Dearborn, Mich., Commissioner of Health
T. C. Colley, M.D., Keller, Tex., Health Officer of Tarrant County
Joseph R. D'Aunoy, M.D., New Orleans, La., Director of Laboratories, Charity Hospital
Harold S. Diehl, M.D., Minneapolis, Minn., Director, Student's Health Service
Zephirin Dupuis, M.D., L'Assomption, P. Q., Medical Officer
M. A. Fort, M.D., Dr.P.H., Bainbridge, Ga., Health Commissioner of Decatur County
J. P. Greenhill, M.D., Chicago, Ill., Obstetrician and Gynecologist
Anna J. Haines, R.N., Boston, Mass., Executive Secretary, Boston Health League
Mrs. Lynn G. Hooper, R.N., Jackson, Miss., Supervising Nurse, Hinds County Health Department
Roy C. Kester, Greenville, O., Chief, Division of Sanitary Inspections, Darke County Health Department
James F. King, B.S., Atlanta, Ga., State Chemist
Jordan Lally, M.D., New York, N. Y., Industrial Physician, United States Rubber Co.
Eugene M. McCarty, M.D., Rumford, Me., Medical Director of the Oxford Paper Co.
Carl C. Mann, Arlington, N. J., Industrial Physician, DuPont Viscoloid Co.
Agnes E. Maynard, R.N., Hamilton, N. Y., Supervising Nurse, State Department of Health
Fredrika Moore, M.D., Boston, Mass., School Health Worker, State Department of Health
Mary R. Noble, M.D., Harrisburg, Pa., Chief, Preschool Division, State Department of Health
Henry G. Oldfield, M.S., Minneapolis, Minn., Assoc. Sanitarian, Milk Sanitation, State Department of Health
George M. Piersol, M.D., Philadelphia, Pa., Medical Director, Bell Telephone Co.
William Pralle, Houston, Tex., Assistant Engineer, Department of Health
Ella H. Rigney, New York, N. Y., Publicity Director, American Society for Control of Cancer
John O. Salyers, M.D., Hazard, Ky., Director of Health, Perry County
Sherwood H. Smith, A.B., Jacksonville, Fla., Executive Secretary, Florida Public Health Association
Antonio Vidal, M.D., D.P.H., Honduras, C. A., General Inspector of Public Health (Assoc.)
Samuel B. Woodward, Worcester, Mass., President of the Worcester County Institute for Savings (Assoc.)

APPLICANTS FOR FELLOWSHIP

PUBLIC HEALTH EDUCATION SECTION: B. S. Stephenson, M.D., Sidney, O.

FOOD, DRUGS AND NUTRITION SECTION: John S. Abbott, Washington, D. C.

CHILD HYGIENE SECTION: Ada McMahan, M.D., Lafayette, Ind.

HEALTH OFFICERS SECTION: Charles H. Benning, M.D., Royal Oak, Mich.; David M. Cowgill, M.D., Twin Falls, Ida.; Gordon T. Crozier, M.D., Valdosta, Ga.; Walter W. Lee, M.D., Indianapolis, Ind.

PUBLIC HEALTH NURSING SECTION: Elsbeth H. Vaughan, St. Louis, Mo.

VITAL STATISTICS SECTION: Mary A. Clark, New York, N. Y.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Diphtheria Prevention in New York City—It was the ancient custom to shake a rattle to keep the evil spirits of disease away. Today we keep the "evil spirits" away by "shaking the rattle" of the mighty microphone, the far-flung film, the trenchant pen, the powerful printing press and mostly by the patient work of great scientists.

The Diphtheria Prevention Commission of the New York City Department of Health records the results of 5 months of modern "rattling" to conquer the evil spirits of diphtheria: 300,000 toxin-antitoxin injections administered; 100,000 children immunized. More than 50 per cent have been of preschool age. Nearly 50 per cent have been treated by private physicians; 120,000 placards displayed for 7 weeks in the subways, elevated, street cars, buses, ferries, etc.; 500,000 homes received pastoral letters issued by Cardinal Hayes, and a message from Bishop Thomas E. Molloy; 2,000,000 pieces of literature have been distributed—some translated into Yiddish, Finnish, Italian, Polish, Greek, Spanish, Japanese and Lithuanian; 5,200,000 people heard our diphtheria movietone in the theatres; 300,000 copies of six Health Tabloids issued; 25,000 handbooks of information issued; 200,000 families canvassed by family physicians; 4,000,000 pieces of literature are being distributed with the statements of gas and electric companies; 11,345 waiting room cards distributed to physicians for permanent posting in their reception rooms; 86 diphtheria stations in operation for those who cannot afford the services of private doctors; 10,000 letters sent each month to mothers whose babies reach their 9th month; 36 daily newspapers and 83 weeklies and semi-weeklies in foreign languages carry our news messages; 2 of the largest moving electric signs in the world are being utilized for our diphtheria message through the generosity of companies operating these signs; 6 "Healthmobiles"—newly equipped Diphtheria Protection Stations on wheels—are carrying diphtheria protection to those children in the congested districts of New York whose parents cannot afford either a physician or a summer holiday. Each truck is manned by a doctor and 2 nurses.

The plan for the fixing of minimum fees for diphtheria immunization to enable the mass of people of moderate means to patronize the private practitioner is now well under way.

Coöperating with the Board of Education Census every home in the Bronx (population 951,900—equal to the whole population of Boston) is now being canvassed, and all children under 15 years—estimated at 150,000—are being followed through to demonstrate the possibility of a diphtheria-free borough.

Seven hundred and fifty 24-sheet posters were displayed at strategic outdoor places throughout the city for 1 month. Fifty of New York's leading citizens constitute the Diphtheria Prevention Commission.

Nine distinguished pediatricians, headed by Dr. Bela Schick and representatives of the 5 county medical societies, constitute a Technical Consultation Board.

Twenty-one leading social welfare and

health organizations comprise an Executive Board of Coöperating Agencies.

Thirty-two editors of newspapers have formed an Editorial Consultation Board.

One hundred and seventy-nine prominent foreign born men and women nominated by 35 Consul Generals serve on a Foreign Groups Committee.

The City of New York under the leadership of Mayor James J. Walker and the immediate supervision of the Health Commissioner, Dr. Shirley W. Wynne, has placed the resources of the Department of Health at the disposal of the commission to the end that diphtheria be wiped out in New York.

The diphtheria campaign is being conducted with funds donated by public spirited groups interested in the public health.—Edward Fisher Brown, Director, Diphtheria Prevention Commission.

General Files for Small Health Departments—The large number and variety of subjects about which health departments have correspondence, together with the necessity for maintaining files of information, make it absolutely essential that there be a general filing system which is simple and effective. The test of effectiveness is twofold: first, the ability to file rapidly and easily, and second, the ability to find material with equal ease and rapidity.

The Racine Health Department is using a general filing system based upon the *Appraisal Form for City Health Work*. The numerical plan of filing is followed, with alphabetical subject index.

The general subject headings under which the filing is carried out, as based upon the *Appraisal Form*, is shown in Table I.

It is impossible in the space here available to go into detail and set forth all of the 1,000 titles. A few divisions are therefore shown as a general guide. Each class of 100 numbers is again subdivided into 10 groups of 10 numbers each (see Table II).

TABLE I

GENERAL CLASSIFICATION

Class	*Numbers*	*Subjects*
0	1–100	Administration
I	101–200	Vital Statistics & Records
II	201–300	Public Health Education
III	301–400	Preventable Diseases
IV	401–500	Maternal and Child Welfare
V	501–600	Food and Sanitation
VI	601–700	Medical, Nursing, Hospital and Clinics
VII	701–800	Reserved for future use
VIII	801–900	Coöperating Agencies
IX	901–1000	Miscellaneous Topics

TABLE II

DIVISION OF CLASSES INTO GROUPS (CLASS 0)

1–100	*Administration*
1–10	Organization
11–20	Personnel
21–30	Finance
31–40	Policy
41–50	Reports, outgoing
51–60	Reports, incoming
61–70	Permits and Licenses
71–80	Inventory
81–90	Supplies
91–100	Miscellaneous

The other groups are subdivided in similar manner. For example, group II, which is Public Health Education (201–300), includes sub-titles given in Table III, to each of which 10 numbers are assigned.

TABLE III

DIVIDING CLASSES INTO GROUPS

201–300	*Public Health Education*
201–210	Health Department Publications
211–220	Other Publications
221–230	Lectures
231–240	Exhibits
241–250	Health Department Library
251–260	Open
261–270	Open
271–280	Open
281–290	Open
291–300	Open

Each of the groups is again divided into 10 unit numbers. For example, in group V, Food and Sanitation (501–600), we take group 511–520 for illustrations (see Table IV).

TABLE IV

DIVIDING GROUPS INTO UNITS

511–520	*Milk and Cream*
511	Farms
512	Dairies
513	Stores (cf. 531–540)
514	Examinations
515	Licenses
516	Ordinances (cf. 2)
517	Grading
518	Adulteration
519	Studies
520	Other cities

In each group there remain a number of unused numbers and titles to allow for the addition of new titles which may be needed. This is in addition to the group of 100 numbers above mentioned which is also being held in reserve.

The necessary equipment and material for the installation of this filing system together with the cost are shown in Table V.

TABLE V

EQUIPMENT

1	4-drawer steel letter size vertical file	$57.00
10	press board guides, metal tab, center position	1.20
100	press board guides, left hand position, tab	6.00
1000	manila letter folders, 1/3 cut, right hand position	19.00
1	visible index binder, capacity 1500 titles	16.00
1500	visible index file cards	8.25
	Total	$107.45

Any office supply dealer will be able to furnish this equipment, which is the standard equipment used for "direct name" systems of filing. The metal tabbed guides are to designate the 10 main divisions, of 100 numbers each. The left hand tabbed guides are for the sub-groups of 10 numbers each. Each unit number has a folder.

Preparation of the system consists first in drawing up the general plan and assigning classes, groups and unit numbers to appropriate titles. For each title a folder is then prepared. Folders are also prepared with numbers only for the untitled numbers to be held in reserve.

The index consists of a visible card for each main group, sub-group and unit number. These are numbered and titled, using "capital and lower case" for the unit number titles and "full capitals" for the sub-groups and main groups. The index cards for each class title bear the list of titles and numbers of groups included. Index cards for groups bear the list of titles and numbers of unit numbers included. In Table IV, there will be noted parentheses (cf. —). These are cross index references. An example of cross indexing is as follows:

In Class 0, group 1–10 is "Organization" and title 2 is "local ordinances." Following this we have cross reference number 501–600. This refers us to Class V, Food and Sanitation, under which we find in group 511–520 Milk and Cream, unit number 516 "ordinances." We also find 526 referring to meat ordinances, 536 store ordinances, 546 restaurant ordinances and 556 other food handlers' ordinances. Note that in group V all unit numbers referring to ordinances end in the same digit "6."

It must further be noted that to make such an index practical, all titles consisting of more than one word should appear in the alphabetical index under the initial letter of each word, for example—Periodic Physical Examinations (309) should appear in the index under "P" and "E" and the title Diphtheria Prevention Clinics should appear alphabetically under "C," "D," and "P."

We have now been using this file for 2 years and find that it practically eliminates the personal equation in filing. When we begin to search for a letter about a given topic it makes little difference from what point of view we approach the subject. If it is about diphtheria we will find it alphabetically so indexed. If it is about diphtheria immunization it will be indexed under both diphtheria and immunization. If it is about educational publicity con-

cerning diphtheria immunization it will be indexed under diphtheria, immunization, education and publicity. The labor involved in keeping this system is small after the initial preparation. If it is carefully planned with a view to the needs of the particular department for which it is designed, few new titles will need to be added. By providing a space on the letter head for entering the file number and determining this number at the time of dictation, both filing and finding are quick and simple procedures. We do not yet see any need for transferring in the near future and it is quite possible that no transferring will be needed until 5 years have elapsed. Some of the titles are little used, and yet it is these very titles which will confuse a straight alphabetical subject file. The time consumed in filing our correspondence has not exceeded 30 minutes per day.

This system can be expanded indefinitely. If sub-titles are required for the unit titles they can be provided by using decimals, and this is frequently desirable for special files. It can also be extended beyond 1,000. In fact, we have so extended it by using the numbers above 1,000 to designate the pamphlet cases in which we file our journals and the publications of other organizations, such as city and state health departments, national organizations, cooperating local organizations and commercial agencies.

A complete outline of the system will be sent in response to requests for the cost of preparation, which is $.75 each, payable to the City Treasurer, Racine, Wis.—W. W. Bauer, M.D., Commissioner of Health, Racine, Wis.

Warwick Town, Rhode Island—Rhode Island in 1927 won the prize in connection with the health studies made by the Women's Federated Clubs. The prize consisted of a special health survey of Warwick, the town chosen by the state health commissioner, which was made by the Committee on Administrative Practice of the American Public Health Association, and was coöperated in by the American Child Health Association.

As a result of the survey, the town council decided to form a health unit with a full-time health officer, and at the financial town meeting in May, 1929, there was appropriated $10,000 for the establishment of a unit, to consist of a full-time health officer, 2 nurses and a sanitary inspector. The town council and the financial town meeting are to be commended for their action, but they should see to it that local politics and deferment of action do not prevent the speedy formation of a health unit, which would be a great asset to a rapidly growing urban community that has some special sanitary problems.—James Wallace, M.D., Associate Field Director, A. P. H. A., New York, N. Y.

Influenza Surveys—Realizing that influenza is an extremely poorly reported disease throughout the United States, and that morbidity reports could therefore not be expected to give a true picture of the actual incidence of the disease, the U. S. Public Health Service decided to carry on a nation-wide survey to determine with some degree of accuracy the real incidence of influenza and the frequency with which it was preceded by, associated with, or followed by, some other condition such as pneumonia, or a cold. The Detroit Department of Health has coöperated in this survey. In Detroit a house-to-house canvass was made in 20 representative districts which included visits to 6,700 homes. In all 18,056 individuals are included in the personal histories obtained but of this number only 17,814 gave sufficient complete information to be included in the survey.

The results of this survey covering the months of December, 1928, and

January, 1929, indicate that 23.9 per cent of the population suffered from one or another of the respiratory infections —colds, influenza or pneumonia. In all 13.2 per cent gave a history of influenza; 1.7 per cent had grippe; and 0.4 per cent suffered from pneumonia. The incidence of 23.9 per cent for the respiratory infections is appreciably lower than the incidence found in the U. S. Public Health Service survey for some of the western cities and slightly lower than most of the midwestern or eastern cities with the exception of Baltimore. The total number of cases of influenza, grippe, pneumonia and colds per 100 persons canvassed for the several communities was as follows: San Francisco, Calif., 34.1; Seattle, Wash., 30.9; Kansas City, Mo., 27.1; Farmington, Mo., 37.7; Des Moines, Ia., 47.1; New Orleans, La., 29.6; Cincinnati, O., 27.0; Pittsburgh, Pa., 25.2; Baltimore, Md., 15.1 (exclusive of colds not confining the patient to bed); Syracuse, N. Y., 26.8; Boston, Mass., 23.5. The average of all these localities except Baltimore and Detroit was 29.7.

Nearly 15 per cent of the population canvassed in all localities surveyed in 1929, except Detroit, gave a history of having suffered attacks of influenza or grippe, while 0.47 per cent gave a history of pneumonia. In Detroit the survey indicated that 14.9 per cent of the population canvassed suffered from influenza or grippe and 0.4 per cent had pneumonia.

If results of the survey reflect conditions in the city as a whole as they should—(1) A very insignificant percentage of the actual number of cases of influenza were reported, while approximately 36.3 per cent of the pneumonias were reported. (2) The average loss of time through suffering from one or another of the respiratory conditions was 8.2 days per individual, with an average of 3.6 days spent in bed per patient. Loss of time varied from 3.6 days with colds to 30 days for pneumonia. Days in bed varied from 1.5 in colds to 18 days in pneumonia. (3) Approximately 43 per cent of all patients secured the advice of a physician. Practically all pneumonias were attended by physicians while less than one-fourth of the colds obtained medical advice. In influenza 52 per cent were attended by physicians.—U. S. Public Health Service Release of July 6, 1929, and *City Health*, Detroit Department of Health, June, 1929.

Physical Examination of Indians—Several of the national health agencies, in coöperation with the Oregon health authorities, made possible the establishment of a diagnostic clinic on the Klamath Indian Reservation in Oregon. The examinations indicate that the average Indian of middle 20's is somewhat overweight, married, clean, well dressed, speaks English correctly, lives in a 4-room house, and there is a three to one chance that some member of his family is ill with tuberculosis. His teeth are unclean and decayed, and one out of five has impaired vision due to trachoma.—*Study of the Health of Indians on the Klamath Reservation in Oregon*, National Tuberculosis Assn., Feb. 1, 1929.

LABORATORY

C. C. YOUNG

A PRACTICAL METHOD OF MEASURING SUNSHINE

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AN improved actinic method of testing sunshine for ultra-violet light has recently been developed in the Research Laboratories of the Chicago Department of Health. It depends in principle on the decomposition of oxalic acid, previously studied by Anderson and Robinson.[1]

The detailed technic, which is simple and readily adaptable to field work, is described in a recent issue of the *Journal of Preventive Medicine*.[2] The apparatus is shown in Figure I.

As a result of correlation of the actinic readings of sunshine with the erythema reaction of untanned skin, the actinic reading yields information as to the presence in appreciable amounts of the physiologically important shorter ultra-violet waves, which are cut out by obscuring factors such as smoke, dust, mist and window glass, and which also vary in intensity with the angle of incidence of the sun's rays to the earth's surface. A reading of 3.53 to 3.72 mg. of oxalic acid by the technic used correlates approximately with the minimal erythema dose of sunshine.

By the method described it is possible for those interested in the health value of sunshine to obtain comparative data on the intensity of solar ultra-violet light in any locality—by hours, months and seasons.

In Chicago it was found that there were 7 months of low ultra-violet values in sunshine and that during most of this period the ultra-violet light inten-

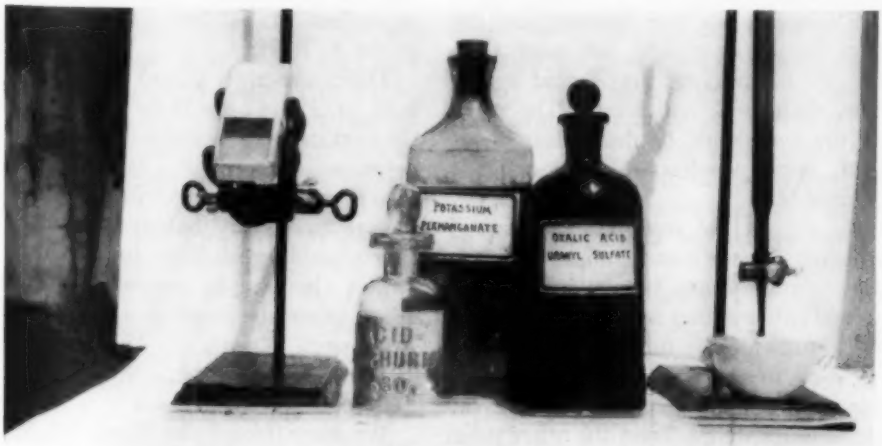

FIGURE I

sity, as judged by the erythema dose, was too low to afford a satisfactory dosage in hourly periods of exposure.

One of the difficulties encountered in the field use of the actinic method in cold weather is the fact that when the solutions freeze even slightly, the sensitiveness of the reagents to light is reduced. During freezing weather, therefore, the readings were heretofore taken indoors through an open window.

Further work on the practical use of the actinic method out-of-doors in freezing weather, indicates that ammonium sulphate can be used to prevent freezing of the solutions without decreasing the sensitiveness of the reagents to light. A 40 per cent solution of the ammonium salt in the actinic reagent prevented freezing down to 4° F. and did not interfere with the reaction. This temperature was the lowest encountered during the experiments and therefore does not represent the lower limit of accuracy of the method. In the titration, a slight correction factor, based on a "blank" control on the actinic-ammonium salt mixture, is desirable in order to check against reduction of the permanganate solution by the unexposed reagents. Salts of sodium could not be used as anti-freezing agents because of their interference with the actinic response. Additional work on this phase of the technic is being done.

REFERENCES

1. Anderson and Robinson, *J. Am. Chem. Soc.*, 47: 718, 1925.
2. Tonney, Somers and Marti, *J. Prev. Med.*, II, 6: 493 (Nov.), 1928.

A METHOD FOR DETERMINING PRESENCE IN MILK OF AGGLUTININS FOR BRUCELLA ABORTUS

A. G. LONG, M. D., FELLOW A. P. H. A.

Director, Laboratory, Maine State Department of Health, Augusta, Me.

PUT about 20 c.c. of herd milk, or milk from individual cows, in clean test tubes of large diameter, and set in the incubator over night. If souring is not complete in the morning or the whey is not clear, add not more than 0.5 c.c. 50 per cent acetic acid to the tube, shake well and filter. The whey for the test should be quite clear or, at most, faintly opalescent. Colostrum is unsuitable.

To set up the test—Use at least 4 ordinary Wassermann tubes for each test. In the front tube place 0.9 c.c. normal salt solution and 0.5 c.c. in each of the other back tubes. Add 0.1 c.c. of whey to the front tube. Mix well. Transfer 0.5 c.c. to the next tube behind. Mix well. Treat the other tubes the same, discarding the final 0.5 c.c.

When dilutions have all been made, add to all tubes 0.5 c.c. of *Brucella abortus* antigen of such concentration that this final dilution gives an opacity equivalent to 1–1,000 (silica standard of the A. P. H. A.).

Tubes are then placed in the water bath at 37° C. for 2 hours, and read the next day after standing at room temperature over night. Positive tubes give heavy precipitates with clear supernatant fluid. On shaking this, precipitate should break into coarse clumps. Unless clumping is present in the first three tubes the reading is reported as negative.

Dilutions are 1–20; 1–40; 1–80; 1–160; etc.

We have found the blood and milk check very satisfactorily.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Insulin and Diabetes—For the first 3 months of 1929 the death rate from diabetes among industrial policy holders of the Metropolitan Life Insurance Company was 23.8 per 100,000, the highest diabetes rate ever recorded for this group. The course of the diabetes death rate among insured males shows that between 45 and 65 years there has been a distinct and significant rise. For females, the only ages showing a decline have been those of childhood and early adult life. From 35 to 45 years of age there has been a slight rise, and after age 55 the female death rate has risen sharply.

A survey of 1,044 fatal cases on which the Metropolitan has paid claims, during the early part of 1929, shows that up to April 15, 63 per cent of the cases received insulin. In a similar survey made in 1924–1925 only 49 per cent of 1,800 cases were given insulin. The percentage of fatal cases treated with insulin was higher in 1929 than in 1925 except in the younger age groups. Between the ages 15 and 44, the percentage of cases treated during 1929 was 84, as compared with 71 in 1924–1925; at ages 45 to 64, 66 per cent as against 52 in the earlier series; and at 65 years and over, 49 per cent in 1929, as against 32 per cent in 1924–1925. At ages under 15, there was no distinct difference between the two series, the percentage treated in each being approximately 70 per cent. The increased use of insulin has resulted in a decline in the incidence of deaths from coma. In 1929 coma was present in 41 per cent of the 1,044 cases. In the earlier series, 48 per cent died in coma. Seventy-three per cent of the coma cases received insulin during 1929, compared with less than 60 per cent in the earlier series. Degenerative conditions such as heart, kidney and circulatory diseases were present in over 60 per cent of the 985 cases in which diabetes was the primary cause of death. Since these diseases occur chiefly after 60 years of age, they form another index of the improvement of diabetes with insulin.—*Stat. Bull.*, Met. Life Ins. Co., 10: 3–6 (May), 1929.

Peptic Ulcer and Cancer of the Stomach—There is a great difference of opinion as to the number of cases of cancer of the stomach due to peptic ulcer. According to several estimates the incidence varies from about 2 per cent to more than 60 per cent. One physician reports that 30 per cent of all ulcers of the pyloric end of the stomach which were resected proved to be undergoing cancerous degeneration. Another states that 26 per cent of gastric ulcers, in all parts of the stomach, were undergoing cancerous degeneration. Three cases were reported in which there were symptoms of gastric peptic ulcer extending over a number of years and which proved to be cancerous. In 1 patient, with symptoms for 12 years, an adenocarcinoma was in the margin of the ulcer. In 2 others, carcinoma was found in the base of the ulcer. In 1 case the clinical symptoms of peptic ulcer had existed for 5 years, and in the other for 30 years.

In 1926, cancer of all organs caused 99,833 deaths in the U. S. Registration Area. There were 35,694 deaths from

cancer of the stomach and liver. Cancer originating in the stomach probably accounts for one-third of all the deaths from cancer in the United States. It can be conservatively estimated that at least one-fifth of the cases of cancer of the stomach arise from peptic ulcer. If removal of so-called precancerous lesions elsewhere in the body is good policy, this should eminently be a proper procedure in ulcers of the stomach that do not respond readily to competent medical treatment.—J. S. Harsley, *J. A. M. A.*, 92: 1813–1816 (June 1), 1929.

The Menace of Appendicitis—For the 5-year periods up to 1920 the appendicitis death rates in England were 50, 62, 69 and 67, respectively, per million population. From 1918 to 1927 both the total number of deaths and death rates showed a continued increase. In 1918 the appendicitis death rate was 65, as compared with rates of 64 for hernia and 81 for intestinal obstruction. In 1927 the appendicitis rate was 70 as compared with 50 for hernia and 65 for intestinal obstruction. A review of deaths from "acute abdomen" at the Leeds General Infirmary, for 1924 and 1925, includes 1,080 cases of acute appendicitis with a death rate of 5.7 per cent. About one-half of these were uncomplicated by abscess or general peritonitis. An analysis of a series of 2,252 cases of appendicitis shows 135 uncomplicated by peritonitis, with no deaths; 913 internal operations, with 3 deaths; and 95 cases with diffuse peritonitis, with 28 deaths. An analysis was made of 2,018 cases occurring over a period of 5 years at London, St. Thomas's and Manchester Royal Hospitals. The average total death rate following immediate operation was 6.7 per cent, rising at St. Thomas's to 8.4 per cent. Among 206 cases of appendicitis operated on at the Great Western Railway Hospital, there were no deaths. Eighteen per cent of the cases required drainage. It becomes increasingly evident that a reduction in mortality will only be effected by greater precision in diagnosis, earlier operation, and standardization of technic.—H. H. Greenwood, *Lancet*, 1: 973–975 (May 11), 1929.

Immunization against Diphtheria—Diphtheria toxoid employed in 3 doses immunized 94 per cent of 100 susceptible persons to the point of a negative Schick test, as compared with 5 doses of toxin-antitoxin which immunized 100 persons to a negative Schick test. The results with both preparations were good, especially since the majority of persons in the series were adults, who are more difficult to immunize than children. The fact that the series given toxoid included children, while those given toxin-antitoxin included no one under 17 years of age, does not account for the difference in results. Exclusive of children, 93.3 per cent in the series given toxoid were completely immunized. In this series no serious reaction occurred with either the toxoid or the toxin-antitoxin. In the series of 100 susceptible persons who were given 3 doses of toxoid and were retested, together with 44 persons who received less than 3 doses and were not retested, 24.3 per cent showed no reaction. A small local reaction was shown after 1 or more doses in 31.9 per cent of the 144 cases; a slight general reaction in 28.5 per cent; and a moderate to severe general reaction in 6.3 per cent. In 5 of the 9 cases in which the more severe reactions occurred, there was a marked "pseudoreaction" in the original Schick test. In 1 other there was a moderate "pseudoreaction"; in 2, a history of a previous attack of diphtheria, and in another there had been repeated exposures to the disease.

Diphtheria toxoid is a better immunizing agent than diphtheria toxin-antitoxin mixtures, even when 5 doses of the latter are given. Diphtheria

toxoid may safely be employed in immunizing adults, and an extra skin test to detect sensitization to the bacterial proteins in the toxoid is not necessary. Care should be taken that the broth employed in producing the toxoid does not contain an excessive amount of protein. —G. J. and G. H. Dick, *J. A. M. A.*, 92: 1901–1903 (June 8), 1929.

Maternal Mortality—Deaths from all puerperal causes in the period 1915 to 1925 numbered 15,876 in New York State. This gave a death rate of 5.9 per 1,000 total births for the period. The average annual rate in 1915–1920, exclusive of 1918 (the year of the influenza epidemic when mortality from puerperal causes was abnormally high), was 5.7 per 1,000 births. The average annual rate in 1921–1925 was also 5.7. In 1921–1925 in the urban part of the state, mortality from puerperal septicemia was 1.3 per cent higher than for the preceding 5 years (exclusive of 1918), and 8.6 per cent higher from other puerperal causes. In rural New York the mortality from puerperal septicemia declined 23.9 and mortality from all other puerperal causes 27.3 per cent.

As a result of a study made in 1925 of 696 maternal deaths in upstate New York, it was found that 74 per cent had received hospital care. Of 230 cases, 13 per cent had entered the hospital before the beginning of labor; 37 per cent entered during labor; and 50 per cent were brought in after delivery. Only 16 cases were reported as having been delivered by a midwife, but 11 others had a midwife in attendance at some time. Sixty-five per cent of 408 cases had prenatal care. It was found that 34 per cent did not have prenatal supervision until the 7th, 8th or 9th month. Puerperal sepsis accounted for 37 per cent of the deaths; albuminuria and the toxemias for 21 per cent; and hemorrhage for 9 per cent. Thirty-eight per cent of the deaths were involved with operative procedures. Hemorrhage was involved in 17.5 per cent of the deaths, 67 being prenatal and 58 postnatal hemorrhages. This study shows the large proportion of maternal deaths caused by septic poisoning and the large number of cases in which operative procedures were involved. It seems that one of the chief causes of excessive maternal deaths is the increasing tendency to interfere with physiological processes. This is more prevalent among city practitioners and in hospital practice than among rural practitioners.—Matthias Nicoll, Jr., *New York State J. Med.*, 29: 800–802 (July 1), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

TYPHOID FEVER OUTBREAK IN FORT WAYNE, IND., DUE TO DUAL VALVE CONNECTION

RUTH C. STURTEVANT

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ON February 26, 1929, people living in the vicinity of the Wabash Railroad at Fort Wayne, Ind., complained to the Health Department of dirty water. An inspector was immediately sent to the locality and he reported that the increased turbidity was probably due to the fact that there had been a fire in the neighborhood. This report was corroborated by the head of the water works and the explanation was accepted. A water sample taken there on that date showed *B. coli* in 0.1 c.c. samples. On February 27, several samples of water were taken in that neighborhood, following continued complaints. Physicians were mentioning innumerable cases of dysentery (although none were actually reported), and on March 1 a drastic water sampling and engineering investigation began.

A dual valve was discovered, owned and operated by the Wabash Railroad. This permitted the use of either river water or city water. The valve had been left open, allowing the city mains to become loaded with river water. The valve was immediately closed, photographed, and ordered discontinued. Five days later it was still in place, although we hope not in use, after which it was eliminated.

Gastrointestinal symptoms broke out in another part of the city and it was found that the reservoir had become contaminated with the river water. It was promptly drained and cleaned. By March 8 the water contamination was completely cleared up, as shown by samples taken from places where previously contamination had been demonstrated.

We have no way of knowing the number of cases of gastroenteritis, but there were many. Onset was from 12 to 24 hours after drinking the water and the victims were acutely ill from 3 days to a week with intense diarrhea, vomiting, pain, and extreme weakness. On March 22 the first typhoid fever cases were reported. There were 53 cases and 3 deaths. The last case was reported on May 11. All cases were traceable to the condition of the water.

Despite the fact that in January, 1924, the Indiana State Board of Health adopted and ordered promulgated, effective June 1, 1924, the rule abolishing all such connections, this one had been in constant use since then. In 1923 this same type of valve connection on the Pennsylvania Railroad property caused a similar outbreak with 147 cases and 20 deaths. At this time, a city-wide search was made for other valves and all were ordered out. The search has been resumed during this outbreak and many such valves have been located, although they were not in use. They have been eliminated.

Process of Aeration in Iron Removal from Water—In general, closed tanks for iron removal are more satisfactory, smaller and cheaper than open tanks, except that, in a closed tank, it is difficult to get rid of the excess of oxygen, which remains absorbed in the water owing to the pressure of the pump. This oxygen corrodes the iron pipes in the distributing system for the water supply, and completely nullifies the effect of the iron removal plant. An apparatus is described, which eliminates this danger, if it is inserted at some point between the reservoir and the pump. It consists of two shafts, with a communicating passage in the lower half of the central wall, into one of which the syphon pipe bringing the supply enters, and out of the second of which the exit pipe leads. The aeration apparatus is built between the two, consisting of three pipes, an injector for water and compressed air, a vertical pipe enclosing the lower half of the injector, and a syphon hood, passing from one shaft to the other. Water containing the necessary compressed air is forced down the injector; it rises up, the vertical pipe mixing thoroughly with the water entering through the syphon pipe, bringing about the separation of the iron. The air and excess oxygen are drawn out of the syphon hood by means of a suction pump. The circulation set up by the compression and suction not only removes the air, but creates an energetic stirring, causing the iron to form a floc, which is easily filtered. Three times the calculated amount of required oxygen is added, i.e., for 100 litres per second with 20 mg. Fe 1 litre per second of air at atmospheric pressure is added. Three plants for iron removal, with this arrangement for aeration, are described, which can be inserted in the supply system. In each, the water is raised 1 to 2 meters above the water surface and let fall through the compressed air injector to the bottom of the removal tank. The water and air rise in the vertical pipe, which is many times wider than the injector. The water is circulated several times in this vertical pipe and the circulation chamber, insuring complete iron removal and development of a good floc. The greater part of the floc settles down into hanging rods or into the rinsing pipe, so that only a small quantity enters the filter.

In one plant described, for inserting near the source of the water supply, the water in the vertical pipe and the circulation chamber circulates about 28 times. Wood-shavings below, and clean, evenly grained gravel above, are used as packing for the filters in these iron removal plants.—A. Vogt, *Tech. Gemeindeblatt*, 32: 6, 1929 (from papers of Water Pollution Research Board, England).

Sterilization of Sea Water by Ozone and Its Use in the Purification of Contaminated Shellfish—Ozone passed through an artificially prepared sea water containing mineral halides had no action on chlorides and bromides but liberated iodine from iodides. It was found that surface sea water (down to a depth of about 100 meters) gave no free iodine upon ozonization, the iodine in the upper strata being in the form of stable organic iodides. Sea water containing heavy suspensions of infectious microörganisms was sterilized in 8 minutes. Sea water ozonized for double the period necessary for sterilization, aerated free from ozone, re-inoculated with microorganisms and incubated for 18 hours gave an abundance of microörganisms, indicating that the water contained no bactericide, and was harmless to shellfish.

Contaminated shellfish in a sterile water undergo progressive self purification, ejecting organisms until the pulp itself becomes sterile. This purification takes several days, varying with condi-

tions. Oysters were immersed for a much longer period than was needed for self purification in changes of sea water ozonized for twice the period necessary for sterilization. These oysters were compared with another batch treated under the same conditions but without ozonization of the water. No difference in appearance, constitution and flavor could be detected. The process can be worked by a rapid sand filtration of sea water, ozonization followed by aeration to eliminate the excess ozone and allowing it to flow continuously over oysters in a trough at a rate of about 100 c.c. per hour per oyster.—H. Violle, *Rev. d'hyg.*, 51: 42, 1929 (from papers of Water Pollution Research Board, England).

Recovery of Tin from the Effluents Derived from the Process of Weighting Silk—In weighting silk, the silk fibers are soaked in a stannic chloride solution, and washed in quantities of water to remove the precipitated tin and the excess chloride. The washing water contains about a third of the tin employed. At present the method employed for recovering the tin is long and costly. The washing water is further diluted to precipitate the greater part of the tin by hydrolysis and neutralized by passing over limestone. The effluent, only partly neutralized, corrodes the channels and pumps and causes the dried oxide to contain impurities, iron and silica which decrease its value. Settlement takes place in a tank, into which the effluent continuously enters, but the sludge is only removed occasionally. The sludge is pumped into a storage tank and then into a filter press, where its water content is reduced.

The filter press is dried later in an oven or drying drum, but the process is long because a skin forms over the oxide, preventing the evaporation of the water. This process is not only long, but 16–75 p.p.m. of tin pass out with the effluent, and more is lost during the pumping process.

Gibson Buttfield of the Vulcan Detinning Company, after a thorough investigation of this process, has invented a new method which is being used with complete success at the works of the Textile Dyeing Company of America, Inc., at Hawthorne, N. J. The washing water, containing tin, is neutralized by an automatically continuous dose of lime-sludge, which precipitates practically all the tin. The coagulated tin-oxide is separated in a Dorr-thickener, continuously pumped into a storage tank and passed on to a spray dryer. Here it dries rapidly and is automatically packed in export casks or sacks. The lime sludge is prepared in a tank with a stirring apparatus. The precipitated oxide is led through a series of resistance plants to remove air bubbles and prevent the floc floating in the thickener.

The spray dryer is made by the Industrial Associates Inc., in New York. This process is very satisfactory, because the loss of tin is only about 4 p.p.m. of effluent, the cost of drying is 50 per cent and the total costs only about third of the old process, and the oxide obtained is cleaner and of a greater value.—*Chem. Ztg.*, 52: 925, 1928 (from papers of Water Pollution Research Board, England).

Disinfection of Swimming Baths in the Tropics with Chlorine and Chloramine—Experiments on the chlorination of the water with chlorine gas, hypochlorite, and chloramine, in two open air swimming pools of the tropics in the municipality of Batavia are cited.

Owing to the strong catalytic action of sunlight in decomposing hypochlorite it was found impossible to keep a fixed minimum residual chlorine in the water of swimming pools with tropical conditions. Disinfection with hypochlorite

could, however, be obtained by distribution at the inlet, at the middle of the tank, and at the outlet; and the adjustment of the amount added, 6 mg. per lit. during the day and 2 mg. per lit. during the night.

The decomposition in sunlight of chloramine was much less, but because of its weaker disinfecting power a sufficiently great minimum quantity of chloramine was needed. In practice, in Batavia good results were obtained with a residual content of 0.4 mg. per lit. of active chlorine as NH_2Cl. Bacteriologically, disinfection with chloramine appeared to give better results.—K. Holwerda, *Mededeelingen Van Den Dienst Der Volksgezondheid in Nederlandsch-Indie*, Vol. 17, 1928, Part II, Foreign Edition, pp. 357–382. Abstr. H. R. Crohurst.

The Effect of Improved Road Surfaces on Public Health—The improvement of public health by hard surfacing of roads has seldom received attention. Some of the factors that assist in this are: (1) Hard surface roads have removed the ever-present dust in dry weather and mud in wet weather which caused injurious effects to both travelers and persons living along the roads. Roads are more easily cleaned and washed, thus removing the collections of liquid and solid animal excreta which were blown into the air with the dust on the former dirt roads; (2) medical men are able to get to their patients more often with less time, and patients may be taken to hospitals with less discomfort in shorter time; (3) food products in fresh condition can be distributed more readily.—W. Lionel Jenkins, *Surveyor*, 74, 1904: 67 (July 20), 1928. Abstr. D. W. Evans.

An Outbreak of Typhoid Fever Traced to Corned Beef Infected by a Carrier—An account of an epidemic of typhoid fever at Wakefield, Mass., a town of about 17,000 population. The place of infection was traced to a church supper, and out of 97 individuals found to have attended the supper, 16 became infected with typhoid fever.

Two tables are given which contain such information as the food eaten by the 15 sick and 49 well individuals for whom this information is available, with the per cent eating each food, the difference in per cent between the number of sick and well individuals who ate each food, and the standard deviation of the differences. The accumulated evidence pointed to corned beef as the mode of infection.

The meat was prepared by 4 women at their respective homes. The only one giving a positive Widal stated that she had had typhoid fever 17 years before. A fecal specimen from this person was positive for *B. typhosus* although her health was excellent at the time of the supper and thereafter. This woman prepared about 20 per cent of the corned beef eaten at the supper, which agrees with the fact that about 15 per cent of the guests became ill.—Clarence L. Scamman and Filip C. Forsbeck, *New England J. Med.*, 199, 14: 664–665 (Oct. 4), 1928. Abstr. F. J. Moss.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Poisoning from Commercial Methyl Chloride—Among the several gaseous substances of more or less toxic nature which recent developments of mechanical methods of refrigeration have brought into usage, are sulphur dioxide, ethyl chloride and methyl chloride. The scientific staff of the Chicago School of Sanitary Instruction has been investigating refrigerant gases for the past 11 months, and intensively for the past 4 months. In the past year there have been reported in Chicago 25 cases of poisoning by commercial methyl chloride gas, with 7 deaths. All except 3 cases (which occurred in a manufacturing plant where methyl chloride refrigerators were made) developed in kitchenette apartments from leaks in the refrigerating system.

The first 4 cases, of which 3 were fatal, occurred in August, 1928. The next 3 cases were first reported as botulism. The next 2 cases, a man and wife, were of less severe type. Then 3 cases were reported in the manufacturing plant above referred to where the illness was characterized by drowsiness and nervous symptoms. Early in June, 1929, 7 cases of uncertain origin were reported in one family and 3 of these died; in the latter part of the same month 3 more cases were reported, with 1 death. Food poisoning was the tentative diagnosis in practically all cases at first; then, later, strychnine, metallic poisoning and mushroom poisoning were suspected in some.

The chief symptoms recorded were drowsiness, mental confusion, stupor, weakness, nausea, pains in the abdomen, and vomiting. In the more severe cases there were convulsions and cyanosis, alternating with coma; later, delirium and restlessness. In some instances the patients were aroused from their stupor by attacks of vomiting. On account of their mental disturbance, several were referred to psychiatrists for diagnosis. Four of the patients complained of blurring of vision and vertigo, which persisted after they had otherwise clinically recovered.

Among the chief physical findings, the pupils in practically all cases were widely dilated and reacted sluggishly to light, while in a few instances a slight squint and unsteadiness of the eyeballs was noted. The pulse, in adults, went as high as 150, and in children reached 165. The respiratory rate in adults reached 32 and in one child was 56. About 36 hours after exposure to methyl chloride, there generally occurred a rise in temperature, reaching as high as 103.5, and in 2 cases just before death it was 107. In nearly all cases there was suppression of urine, which sometimes lasted 48 hours. Urinary specimens tested showed acetone, and formates were found in the 2 specimens for which it was tested (acute stages), while occasional albumin, red and white blood cells were found. Coma in some cases lasted to 72 hours, with recovery. Death in every case was preceded by severe convulsions, tonic in character, and accompanied by a profound cyanosis followed apparently by respiratory paralysis. The blood picture was suggestive of a pernicious anemia ranging from 56 to 85 per cent hemoglobin, with the white count averaging 16,000 on the 3d day.

"The diagnosis is based upon the symptoms and the physical findings

previously noted, together with the presence of formates and acetone in the urine and a history of exposure to the gas." The breath has a musty, sweet odor, and there is an odor of acetone about the patient. A gradual onset of 2 days or more, with drowsiness and mental confusion, is an outstanding syndrome. The spinal fluid was under increased pressure in the 2 cases tested, while the blood pressure was significantly lowered in several of the cases. Examination of the stools failed to show blood in 3 cases.

The poisoning must be differentiated from botulism, poisoning by strychnine, wood alcohol, grain alcohol, and heavy metals, and from sleeping sickness (encephalitis lethargica).

The treatment consists of immediate removal of the patient to a hospital, and giving of alkalies. Oxygen inhalations should be given from the start and continued until the peculiar odor of the breath and body has cleared up. Under no conditions should chloroform or chloral be given. The balance of the treatment is symptomatic.

Upon post-mortem examinations, the surface of the bodies revealed nothing unusual, but muscles and blood were of a dark red color resembling that seen in carbon monoxide poisoning. The lungs showed edema and passive congestion; the kidneys, liver, and spleen—cloudy swelling; the stomach—marked hyperemia and even pinpoint hemorrhages; and the brain—intense hyperemia, with softening, and, in 1 case, a small clot.

Chemical examinations of the tissues failed to show the presence of methyl chloride, carbon monoxide, heavy metals or alkaloidal poisons in any instance. It was not anticipated that methyl chloride would be found because of its low boiling point and rapid oxidation.—*Chicago's Health* (edited by Arnold H. Kegel, Commissioner), *23*, 15: 90–95 (dated *April* but issued *July 18*), 1929.

ABSTRACTOR'S COMMENTS: These are additional impressions gained while a member of two Coroner's Juries, the first called by County Coroner, Dr. Herman N. Bundesen, to consider the June 30 death of a young married woman living in an apartment hotel on the North Side (her husband and mother narrowly escaped with their lives), and the second likewise called by Coroner Bundesen to determine the cause of death of a father, mother and small baby which took place July 16 in another apartment hotel on the South Side (not included in the above abstract).

The members of the first jury were: Dr. Morris Fishbein, Editor of the *Journal of the American Medical Association*, Foreman; Dr. H. Gideon Wells, Head of the Department of Pathology at the University of Chicago; Prof. F. C. Koch, Head of the Department of Physiological Chemistry there; Prof. Morris S. Kharasch, Acting Head of Department of Chemistry at the same university; Dr. R. H. Jaffe, Director of the Pathological Institute at Cook County Hospital; and the writer.

In the second jury, Dr. Wells acted as Foreman while Dr. William I. Fishbein, Physician in Charge of the Laboratory School of the University of Chicago, and Dr. Russel M. Wilder, Professor of Medicine at the university, took the places of Dr. Morris Fishbein and Dr. Jaffe of the first jury at the first hearing. At the second and final hearing, Dr. Morris Fishbein again acted in his own stead.

The juries inspected the apartments in both instances. The apartments had a weather exposure only on one side, and the three windows in each case were said to have been found wide open when the first help arrived, although the shades were half drawn in the second mishap. Both apartments were located on the fifth floor and not obstructed by

nearby buildings. There was, however, no cross ventilation. The weather was hot on both occasions. Exposure was 40–48 hours for 2 of the patients and about 24 for the other in the first mishap; but the 3 deaths in the second mishap took place after an exposure of not over 20 hours, and probably between 11 P.M. and 6 A.M.

Both vomitus and fecal matter stained the beds. The air had a sweet, musty odor which seemed more pronounced in the tiny kitchens where the iceboxes were located, although the methyl chloride contents of both boxes had been drained some hours before we arrived. Its presence in the air was still easily detectable by the green-blue flame of the Bunsen burner after the flame had passed through a small piece of copper gauze, and in both instances the flame increased in size and brilliancy when the icebox was approached. In the second mishap several gold fish in two small glass aquariums were alive and apparently unharmed, but the water, upon testing later in Prof. Kharasch's laboratory, showed it had absorbed a large amount of chloride. A mouse was found dead under the dining room table in this apartment.

In both instances some 50–100 icebox units in as many apartments had been hooked up to one methyl chloride storage tank located in the basement in which a pressure of about 100 lb. was maintained by an automatic pump, so that a leak in one unit might drain practically the whole system. The defrosting was left to the janitors, and was attended to about every 10 days. While all units and connections were claimed to have been tested repeatedly under high pressures before occupancy of apartments, it was suggested that if de-frosting were not frequent enough, coats of ice thickening on the coils in an icebox might spring the coils until a leak occurred, or a joint might leak. Service men testified that the only test they made for leaks was with lather made from shaving soap and applied with a brush, but admitted that they could not reach all parts of coils, etc., with same. It was stated also that some of the unions between the coil units and supply pipes in the iceboxes had proved defective.

While icebox manufacturers had had mishaps in which large quantities of the gas had occasionally escaped, and workmen had suffered and sometimes had been off for as long as 2 weeks, nothing serious had happened and it was not thought domestic exposures would ever approach these in magnitude. No previous research upon the matter had, however, been made, and most thought that small amounts even over a prolonged period were harmless.

Testimony showed that a similar mishap had occurred in the North Side apartment hotel on the first floor some 6 weeks previously, in which the husband had been found unconscious, taken to a hospital, and later removed to the county psychopathic hospital for restraint and care, for several days. Service men of the company concerned had examined the icebox at that time and pronounced it intact.

Dr. Ralph W. Webster, toxicologist for the county, testified that he found methyl chloride in the food left in the icebox in the first mishap, and found formaldehyde and formates in the organs of the woman who had died, and that two guinea pigs left in the apartment likewise showed formaldehyde and formates in their tissues; also that two other guinea pigs had died after an exposure of about 30–40 hours. Examination of the organs of the 3 victims in the second mishap showed methyl alcohol, formaldehyde, and formates, while the blood showed an excess of chlorides.

The *Journal of the American Medical Association*, July 27, 1929, page 312, published a list of 35 trade names of mechanical refrigerators and refriger-

ants used, so far as is now known; of these, 8 were using methyl chloride. In the July, 1929, issue of this JOURNAL, page 825, we called attention to *Public Health Bulletin 185,* which discusses experimental toxicity of methyl chloride and related substances. A comprehensive article with case reports by Kegel, McNally, and Pope is contained in the August 3, 1929, issue of the *J. A. M. A.*, pages 353–358.

It is probable that following the reported banning of the use of methyl chloride in iceboxes in Chicago by the Health Commissioner, something will be found to add to it in the way of an odor and an irritant to render its presence noticeable in the case of leaks. It was said there were 75,000 installations of methyl chloride iceboxes in Chicago alone; also that manufacturers were especially interested in stopping leaks of the substance because it was an expensive chemical. The prospects also seem to indicate that a non-toxic refrigerant has now been discovered.

Sequelae are occurring in some of the more severe cases, such as unsteadiness of gait, tremor, visual disturbances, weakness, insomnia and lapses of memory.—EMERY R. HAYHURST.

Progress in Metal Mine Ventilation—The recent occurrence of a number of deaths from heat stroke in the deep gold mines of South Africa, in a practically saturated atmosphere with temperatures between 85° and 91° F., calls attention to the fact that such temperature and humidity conditions are to be found in a considerable number of deep metal mines of the United States. While in Australia ice has been used for cooling mine air, the most effective remedy is the continual circulation of large volumes of fresh pure air from the surface. This also greatly dilutes the dustiness because of which there is now much silicosis as well as kindred diseases. Most certainly other dusts than silica are harmful, as has recently been pointed out by the U. S. Public Health Service in the investigation of the dust associated with cement working.

Metal mines are likewise subject to fires, and occasionally there have been carbon monoxide mishaps due to the burning of a small amount of combustible matter such as the debris from boxes, sawdust, etc.—D. Harrington, *Information Circular 6136,* U. S. Bureau of Mines, Washington, D. C., 1929.

Bureau of Industrial Hygiene in the Michigan Department of Health—The bureau was officially established April 1, 1929. A survey has already been made of a number of industrial health departments in the state and others will be made. A number of definite objectives have been formulated for the work of the Division and a physician who has had considerable experience with the department as well as in industrial medical work has been placed in charge of the bureau. Thus far, about 100 establishments have been surveyed ranging from 150 to 30,000 employees.—*Bull. Am. Ass. Indust. Phys. & Surg.,* III, 3: 3–5 (June), 1929.

International Conference on Silicosis—The Chamber of Mines of Transvaal, South Africa, has donated 2,000 pounds to the International Labor Office for defraying the expenses of an international conference of experts on silicosis, at Johannesburg in 1930.

Experts from Great Britain, the United States, Canada, Germany, Australia, and South Africa will discuss medical aspects of silicosis with especial reference to its control and prevention in mines.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Permissible Content of Arsenic in Food—This article includes observations made by the author as a result of a resolution of the association of canton and city chemists held in Geneva, June 7, 1929. The permissible limits for arsenic in food are considered: first, those additions which are intentional and, second, those which are unintentional. The first is subdivided into two headings: the intentional addition of arsenic to food, and the natural or accidental contamination of food with arsenic.

The association was unanimous in declining to recognize the deliberate addition of arsenic to food. Arsenic can always be determined in plant and animal organs. Sea water as well as water from springs or streams contains arsenic; it is in the soil, even in primeval rock (0.06 mg. per 100 gm. in granite, 0.4 to 1.3 mg. in marl, and 0.25 to 0.5 mg. in virgin soil of the United States). The highest amount actually occurring in plants is in wild oats and beets—0.062 mg., 0.061 mg.—and in tobacco 1.02 mg. per 100 gm. of dry substance. This arsenic is absorbed through the roots, experiments showing that arsenic spray on the leaves of the *Beta vulgaris* is not absorbed through the leaves. These amounts are not dangerous and need give no concern unless it should eventually be found that such minute amounts play a rôle similar to the vitamins in nutrition.

With the unintentional, especially undesirable additions of arsenic occur higher figures, (1) through the use of fertilizers, (2) through spraying (arsenic distributed in the ground may be absorbed by the roots and contaminate vegetables planted therein), (3) especially through the spraying of fruit itself. Under (1) and (3) the arsenic is absorbed in the plant and cannot be removed; under (2) there is a possibility of reducing the arsenic content by (a) limiting spraying to only immediately after blossoming, (b) more or less by rainfall, (c) by dipping the fruit 5 minutes in 0.3 to 0.5 per cent hydrochloric acid followed by a water rinse and (d) with fresh apples and pears by peeling (in fruits such as plums, prunes, berries, dried fruits, and preserves, the latter is not feasible).

Arsenic is detected in the skin, hair, feathers, bones, and internal organs of animals, and it is pointed out that while the maximum dose is from 5 to 15 mg. a noticeable effect follows the administering of 0.10 mg. There is a discussion as to the effect of arsenic on the organism. Pentavalent arsenic is nontoxic but easily reduced to the trivalent toxic form. Idiosyncrasy toward arsenic is not unusual and for that reason significant.

Comparison is made between arsenic in small and large doses; the former prevents oxidation although it accelerates growth and effects an interchange of metabolic process and apparently increases the formation of red blood corpuscles. A large dose is followed by loss of weight and increased decomposition of the elementary tissues, corresponding interference with the organic functions, breaking down of red corpuscles and fatty degeneration of organs. Owing to individual idiosyncrasies and variation in resistance it is

difficult to draw a line between large and small doses.

The chronic effect of arsenic is significant, especially on those organs most in demand for life processes, the kidneys, liver, capillaries and blood. Various amounts of arsenic are recorded in food, from undetectable amounts to as much as 1.854 mg. on one apple.

The author is compelled to register objection to the introduction in commerce of heavily sprayed fruit and is led to believe that the limit of arsenic permitted in England on apples—1.43 mg. per kg.—is entirely too high. In view of the fact that arsenic in small doses in foods shows definite and undesirable effects, that idiosyncrasy toward it is not unusual and on account of the continually increasing fad for raw food the following proposal is made:

That the highest permissible content of arsenic in food and food substances should not exceed 0.1 mg. of arsenic per kg. Exception is made for certain arsenic bearing natural mineral waters on the ground that they are dispensed as medicines and not as articles of food. —Prof. Dr. E. Waser, *Mitt. Leben. und Hyg.*, Band 20, Heft 3, p. 147, 1929.

The Loss of Iodine and Other Mineral Substances in Spinach, Resulting from the Customary Culinary Preparations—In this experiment the customary culinary operations were followed, in that tap water and added salt were used in place of distilled water as was the case with previous investigators. Summer spinach was washed free from sand and dried at 60° F. and ground in a mortar to a uniform powder. This was analyzed and the results are given. Picked and washed spinach was added in small portions to boiling tap water containing common salt. As the water continued to boil, the spinach was kept under the surface. After cooking, the water was removed, the spinach washed, and the liquids dried at 100° F. The residue was analyzed and compared with the mineral content of the original material. The greatest loss in basic substances was in the case of potassium, and the least in the case of sodium, the total loss of mineral salts being 44 per cent.

Due to the opinion that the basic element in the ash of foods is valuable in correcting acidity, comparison was made between the loss of basic and acid radicles in the cooked spinach. It is found that the loss in bases in the cooked spinach was 10.15 mg. per 100 gm.; of acids 4.13, but there is still in the cooked spinach considerable excess of bases. Separate determinations were made for the loss in iodine in cooking which were found to be 3.5 gamma (gamma — 0.001) for 100 gm. of fresh spinach. The loss is less than one-tenth of the original iodine content, the conclusion being that it is present in organic combination and not in the form of easily soluble salts.—A. Meiermeister, *Ztschr. f. Unter. der Lebensmittel*, Heft 2/3, Feb.–Mar., 1929, p. 235.

The Effect of Drying and of Sulphur Dioxide upon the Antiscorbutic Property of Fruits—Only one experiment in the literature on commercial dried fruit was found which, with the varying results reported on the canning and preparation of fruit, led to the work here reported. The fruit used was ripe peaches grown in California. The fruit was cut, pitted, ground, packed in small tin containers and kept in a freezing room at 17° F. Other portions were sun-dried (sulphured and unsulphured) and dehydrated (sulphured and unsulphured), sulphur dioxide being employed in the ratio of 1,840 to 1,875 parts per million. A scorbutic basal diet of rolled oats, skim milk powder, sodium chloride and cod liver oil was used. The animals (young guinea pigs) succumbed to scurvy on this diet in 25 to 35 days.

Five various modifications of fruit were given in separate test doses and all of the results are tabulated for the feeding periods, which varied from 32 to 90 days. All animals on unsulphured fruit, either sun-dried or dehydrated, succumbed early, in a manner similar to those on the basal diet alone. Animals on the sulphured fruit, both sun-dried and dehydrated, were practically free from scurvy for the 90-day period. The question was raised as to whether the protective action was due to decreased oxidation due to coagulation, or because of the reducing action of sulphur dioxide, or to greater stability of the vitamin in the more acid medium. Comment is made on the result of this investigation with the question as to the deleterious effect of sulphur dioxide on human health. Since arbitrary limits for sulphur dioxide in fruit have been placed by certain foreign countries and one or two states in this country it seems desirable to know at what sulphur dioxide content the protective action on vitamin C is effective. The antiscorbutic power of sulphured dried peaches is high, 1 gm. of the product being equivalent to 1.5 to 3 gm. of oranges or lemon juice, or fresh tomato, and to 3 times that quantity of banana, 6 times the amount of raw apple or pear or cooked potato. Similar experiments are being conducted on prunes and apricots and the effect of lye-dipping on vitamin C content is also being investigated.—Agnes Fay Morgan and Anna Field, *J. Biol. Chem.*, 82: 579 (June), 1929.

The South Carolina Food Research Commission—The South Carolina Food Research Commission was authorized in 1928 by the session of the South Carolina legislature to conduct studies on the iodine content of vegetables grown in that state. Tables are given showing the content of these vegetables compared with those grown in other states, which run from 98 p.p.b. in sweet potatoes to 754 in lettuce, in the dried vegetable. It has been suggested that the high iodine content of South Carolina vegetables is due to Chilean sodium nitrate. The authors point out that this nitrate contains very small amounts of iodine and the section of the state showing the highest goiter incidence and the lowest iodine in vegetables was the site of the largest use of Chilean nitrate. In a study of the effect of diet in goiter cases now under way, only 4 out of 27 cases so far investigated included vegetables in the diet.—William Weston and Roe E. Remington, *J. A. M. A.*, 92: 2161 (June 29), 1929.

The Respiration Factor in the Deterioration of Fresh Vegetables at Room Temperature—The rate of respiration was the index used to determine the degree of deterioration in fresh vegetables as handled for market, previous work having shown marked changes in green sweet corn and asparagus. A description is given of the respiration apparatus. The experimental material was fresh vegetables of edible maturity brought directly from the garden into the laboratory without wilting. The varieties used were beets, green onions, carrots, lettuce, green beans, pimentos, mangoes, okra, tomatoes and asparagus. The material collected was at a temperature of 30° C. and this was maintained as a working temperature. Determinations of respiration losses were made at intervals for a period of 30 hours. Curves are given showing the amount of CO_2 evolved per 100 gm. dry weight per hour. The total weight of carbon dioxide evolved was determined and by calculation the amount of glucose lost between the 2d and 26th hours. The vegetables, according to the amount of gas evolved for equal weights of dry matter, range in the following descending order: asparagus, lettuce, green bean, okra, green onion, carrot, tomato,

beet, green mango, red pimento. The corresponding amounts of glucose vary from 13.68 gm. per 100 gm. for asparagus to 1.29 gm. for pimentos.—Marjorie P. Benoy, *J. Agri. Res.*, 39: 75 (July 1), 1929.

Iodine Survey of Nebraska—Nebraska is not included in the goiter area of the United States, indicating appreciable amounts of iodine in the soil or water. To confirm this, samples of drinking water, soil and food materials were secured and analyzed. The soil samples indicated amounts from 0 to 15 p.p.b. and the water samples from 8.8 (at Lincoln) to 30 p.p.b. (at Peru). A table is given showing the iodine content of various foods grown in the state which varies in p.p.b. from 62 in cabbage to 220 in carrots. Corn, wheat and onions showed no iodine content. The water analysis did indicate that there is sufficient iodine except in the extreme northern part of the state where less than 5 p.p.b. of iodine are found. While the soil analysis indicates deficiency in iodine, it is believed that some of this was in soluble form and has been leached out by rain and surface water. Food materials are not regarded as low in iodine, comparing very favorably with figures reported for non-goitrous regions.—W. H. Adolph and F. J. Prochaska, *J. A. M. A.*, 92: 2149 (June 29), 1929.

Composition of Bone. VI. Effect of Massive Doses of Irradiated Ergosterol—This work records the analyses of a number of bones which were obtained from autopsied rats in experiments with massive doses of irradiated ergosterol. One group of rats was fed 2 gm. of cod liver oil to every 100 gm. of the ration, and another group was the control. The serum calcium of the control rats was 10.9 mg. per cent, that of the cod liver oil group was 13.9 mg. per cent, and that of the ergosterol group was 16.1 mg. per cent. The mean of all ratios of residual calcium of bone was found to be 2.00 compared to 1.99 for normal rat bones. Control ratios were 2.09 and 2.02, the ergosterol group 2.03, 2.00, and 2.04, and the cod liver oil group 1.91 and 1.93. Figures for the ratio in all of the bones of all of the groups closely approached the mean. —Benjamin Kramer, M. J. Shear, and Margaret R. McKenzie, *J. Biol. Chem.*, 82: 555 (June), 1929.

The Sanitary Significance of Leucocytes in Milk—It is difficult to understand the true significance of variable numbers of leucocytes and other types of cellular materials in milk without an understanding of the reason for their presence. The fat laden gland cells and gland cell nucleuses present in limited numbers in normal milk represent wastage from the active gland and have no sanitary significance. Leucocytes even in fairly large numbers, i.e., millions per c.c., may be present in milk that is normal so far as is evident from ordinary chemical or bacteriological examination. On the other hand, excessive numbers of leucocytes are usually associated with some abnormal condition, particularly mastitis. The usual form of mastitis is one caused by an infection with streptococci and these bacteria are usually evident among or in the leucocytes when the milk has come from a cow suffering from an inflamed udder. Pathogenic streptococci are sometimes difficult to distinguish microscopically from saprophytic streptococci. Other bacterial infections of the udder may also cause increased numbers of leucocytes to appear in milk.—Robert S. Breed, N. Y. State Agri. Exper. Sta. *Bull. No. 568* (Apr.), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Maternal and Infant Mortality and Morbidity—Indications multiply that all over the world a concerted effort is being made to do something about that most outstanding problem of public health, the maternal and infant mortality rate. To do anything of importance about it, we must do two things: (1) learn more about the factors involved; and (2) get to the public the information we already possess.

There are many pitfalls, however, in getting such information to the public. It is too easy to become merely a propagandist and to give to the public as facts things which we wish were facts or hope are facts. There seems to be a great fear of acknowledging the limitations of our knowledge. And then there is the great delusion that all that is necessary to reduce the maternal mortality is to spend money.

It will be interesting to see what will be produced in the course of the campaigns referred to below, by two English speaking countries somewhat more given to conservative statement than we ourselves are. Both of the extracts to follow are from the *Child-Welfare News Summary*. The first is based on an article in *National Health*, London, June, 1929, p. 411:

> Under the auspices of the National Association for the Prevention of Infant Mortality a joint committee has come into existence for the purpose of enlightening the public on the subject of maternal mortality and morbidity in childbirth. The committee now includes representatives of 11 prominent organizations especially interested in the subject, and others have been invited to cooperate. All organizations of women, both national and local, whether technically interested or not, will be asked to assist. The committee plans to conduct a nation-wide campaign and has undertaken to prepare a panel of speakers for public meetings and supply them with up-to-date statistical material.

The second reference comes from our neighbor, Canada, whose problems are in many ways so similar to ours, and appeared in the *Canadian Child Welfare News*, Ottawa, May 15, 1929, p. 42:

> The Canadian Council on Child Welfare has announced that through the interest of the Canadian Life Insurance Officers' Association it will be enabled to undertake a 3-year intensive educational campaign in the field of maternal and infant welfare. The council has been carrying on considerable educational work in coöperation with the public health departments of the provinces in the distribution of simple prenatal letters and diet folders and other material on nutrition. The organization now plans to issue prenatal and postnatal literature, and malnutrition and diet folders, published in both English and French, which will be prepared and reviewed by competent authorities before release. A special feature of its work will be the preparation of health exhibit material, which will be available to other organizations, to conferences, and especially to women's conventions, fairs, and summer picnics in the smaller towns and cities and in the rural areas. The work will be directed by a committee of the child hygiene section of the council, which will include representative public health workers from different parts of the Dominion.

Baby Health Stations and Family Budgets—It is generally believed by young and inexperienced health officers that, given a large enough budget, they can forthwith banish disease from the world. It is sometimes believed by young social workers that bigger and busier clinics and more of them constitute the panacea for most of life's ills. Enlightenment—or disillusionment—often follows an open-minded study of the question. But open-minded studies

are not so common as they might be. However, the one reported by Margaret H. Lyman for the New York Tuberculosis and Health Association in *The Modern Hospital,* June, 1929, seems to be in that class.

The investigation in question studied the economic status of those making use of the 13 baby stations in the Bronx. Fifteen per cent of each station's registration during September and October, 1928, chosen at random, formed the basis of the study. Seven hundred and twenty-two families were visited in their homes and the usual social data obtained for the purpose of determining financial status.

The results showed that in 87 per cent of 501 families the father made his living at a trade or in a factory. Eighty-five per cent lived in 4 rooms or less. The families, in the majority of cases, consisted of 3 to 5 persons. More than one-fourth were considered to be living under unhealthful conditions.

Only 21 per cent of the families were considered to have incomes adequate to meet a standard of comfortable living. The investigators here show great self-restraint in that they do not commit themselves as to whether this 21 per cent should be expected to pay for service such as they went to the clinic for. They advise further study of the question.

It is greatly to be hoped that this further study may be forthcoming, and that someone will study with equal care those attending the many well child, dental, eye and other clinics in smaller places, often carried on at public expense.

Dental Hygiene in Massachusetts—The June issue of the *Commonhealth* (the quarterly bulletin of the Massachusetts Department of Public Health) contains an interesting statement on 10 years' progress in dental hygiene, and a more detailed report of the work carried on by that department during 1928. Dental work, especially on the part of municipalities, has grown rapidly of recent years in various states and this growth has not everywhere been a healthy one from a social point of view. In too many instances municipal or state departments of health have conducted dental clinics with little or no appreciation of the principle of family responsibility for medical care.

In 1919, states the article, Massachusetts inaugurated a dental advisory and informational service, in charge first of a dentist and later of a dental hygienist. At that time 43 communities in the state had a definite school dental program; at present the number is 223 (out of a possible 355). The number of school dentists has grown during this period from approximately 50 to 250. In 1919, there was only one dental hygienist in public health work in the state; at present there are 50 doing school work in the various communities.

Turning now to the report of the Consultant in Dental Hygiene for the year 1928, we get a more detailed picture of the way one state handles its dental hygiene problems. Work is carried on under a fixed policy which has the approval of representative state dental organizations. An advisory committee aids the consultant in matters of policy and regional consultants nominated by the president of the state dental society aid in local problems and situations. On the part of the local workers themselves, interest is evidenced by the formation early in the year of the Association of School Dental Workers, with a membership of 345.

A realization of the need of better training for school workers in dental hygiene resulted in a course for dental hygienists in school dental procedures being given at one of the state summer schools.

A general informational service, which

includes pamphlets, delineascope films, etc., is of course offered. It is interesting to note that the lecture service is being curtailed to give more time, it may be inferred, for work that is less of a shot in the dark.

One great danger of any dental program is that it may be confined to the group which makes use of the dental clinic. To obviate this, a campaign was started as part of the May Day-Child Health Day program which had as its object the interesting of every child and his parents in a clean mouth. A system of dental certificates was made use of, with rewards for child and schoolroom meeting the requirements laid down to insure clean mouths. This scheme had the merit of bringing the family dentist as well as the clinic into the picture.

On the whole, these two reports show what can be accomplished in the way of leadership when a state consultant in dental hygiene keeps his (or her, as in this case) feet on the ground, avoiding the insidious pitfalls of state clinics and other manifestations of so-called state medicine. Furthermore an advisory rather than a supervisory relationship seems best adapted to foster a strong local sense of responsibility.

Health of the Child in Industry—In spite of present-day interest in the health of the school child, most communities have strangely overlooked their responsibilities to that child who is partly in and partly outside the public school system; that is, to the child in industry who attends the continuation school. In an article reprinted from the *American Child*, Rowell discusses Preserving and Promoting the Health of Working Children, and starts off with the reasonable proposition: "Protection and promotion of health is just as desirable in continuation schools as in (the ordinary) public schools." Many children will or must go to work; how can we minimize or prevent entirely injury to their health?

The continuation school child is at a crucial period of his physical and mental life. He is growing rapidly and should be under strict supervision. It is often for his best interests that he be forbidden to go to work; at least, if he is allowed in industry he should be safeguarded against avoidable hazards.

Theoretically, it is pointed out, the health program of the continuation school should consist, as in the regular school, of health service, physical education and health education. As a matter of practice, however, there are difficulties in the way of this, due in part to the brief period each week that such children are in school.

Several interesting points are raised by Rowell with regard to present practices for handling health certification. Why is not use generally made of the cumulative health records supposedly available in the hands of the school authorities? Again, why should not the child be charged a small fee for the physical examination at the certificating office, the proceeds to be used to improve the health service?

A suggestion is made that in the case of certain adolescents a test may be made of their ability to do well under conditions in industry, by allowing them to work for a few weeks and then checking up on their reactions. Follow-up work by directing a child toward remedial measures may render him eligible to work.

The author, further, discusses the type of physical education desirable for those in the continuation school, based on the type of work the individual is engaged in. The requirements of the clerical worker are not necessarily those of the shop worker. Health instruction is dealt with at some length. The difficulties here are of various kinds, such as the wide spread of mentality of the pupils and the usual lack of health

background of the continuation school teacher. Methods of approach to different classes of pupils are discussed.

Emphasis is laid on the necessity for: (1) a health education specialist in all continuation schools; (2) more research; (3) a well planned program based considerably on local needs.—Hugh Grant Rowell, M.D., Preserving and Promoting the Health of Working Children, *Pub. No. 352,* National Child Labor Committee.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

THE INTERNATIONAL COUNCIL OF NURSES' CONGRESS IN MONTREAL

All attendance records for congresses of the International Council of Nurses were beaten when 8,000 nurses from all quarters of the globe met in Montreal July 8–13.

The countries whose national nursing associations are affiliated with the International Council of Nurses are Great Britain, United States, Germany, Canada, Denmark, Finland, Holland, India, New Zealand, Belgium, China, Italy, Norway, South Africa, Bulgaria, Cuba, France, Irish Free State, and Poland. The Nursing Associations of Brazil, Greece, Jugo-Slavia, the Philippines, and Sweden became affiliated with the I. C. N. in a very touching ceremony at this meeting. Nurse delegates were sent from all these countries to Montreal; in some cases their expenses were paid by their governments.

Other countries sending nurse representatives to the meeting were Czechoslovakia, Esthonia, Iceland, Japan, Korea, Latvia, Switzerland, Turkey, Hungary, Palestine, Spain, Syria and Uruguay.

The three countries affiliated with the International Council of Nurses having the largest memberships in their national nursing associations are the United States with 75,000 members, Great Britain with 33,845 members and Canada with 10,216 members.

One might wonder what so many nurses, from so many countries with languages, customs, races and traditions so different, could have in common in a professional way. But for one who had never before attended an I. C. N. convention the similarity of aims and ideals of the forward looking nurses in all the countries was striking. All were bending their efforts to raise the educational standards and improve the social status of the nursing profession. And Nina Gage, R.N., of New York, President of the I. C. N., in her address on the opening night, spoke the key words of all the proceedings at the Congress when she said: "Through all our problems runs the scarlet thread of our ultimate object, better care of patients, whether in home or hospital, ill or prevented from becoming ill."

Mlle. L. Chaptal, Directress of the "Rue Vercingetorix" School of Nursing in Paris and President of the National Association of Trained Nurses of France, is the new President of the International Council of Nurses.

The next Congress will be held in Brussels and Paris in 1933.

*Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

The Place of Health Exhibits at County Fairs—People go to county fairs more for the purpose of seeing things than to have things done. They see prize products from over the county on exhibit; conceive new ideas about different degrees of perfection; and go home determined to attain a new perfection in the various phases of farm life.

It seems logical then that a health exhibit at the fair is the thing most needed to make people go home and do the things that will promote personal and community health. Experience in Texas has shown that health conferences cannot be successfully conducted at county fairs.

Public health nurses in Texas are asked to arrange exhibits at their fairs and have pictures taken of these exhibits to send to the Texas State Board of Health, with a description of the apparent effectiveness of the exhibits. These will be discussed at the next staff conference of public health nurses and all will gain new ideas and suggestions for next year's fair work.—H. W. Barnett, News Items from the Texas Field of Public Health Nursing, *The Gleaner*, June, 1929.

The Public Health Nurse and the County Doctors—If a nurse must choose between having a large number of children receive toxin-antitoxin administered by state workers at cost, and a smaller number receive it administered by the family physician at an increased cost, she should choose the second alternative because in the long run it is better to keep the confidence and favor of the doctors which she needs to carry on her whole health program in the community.

If the public health nurse advises patients to attend the free tuberculosis, dental or baby clinics put on by the state, without due regard to the rights of the family physician, friction will ensue. So it is better that patients should be referred to the clinics by the family physician, and any treatment advised should come from him.

A public health nurse should be wary about accepting a patient's word that his financial condition will not permit him to pay for medical treatment, unless she is otherwise very sure of it. In case of doubt it is always well to consult his physician if he has one. There are families, however, who have not the means for necessary medical attention, and here again the family physician, if there is one, should be given the chance to treat the family free, or at a nominal charge if he cares to, or suggest sending the patient somewhere else.—Nancy W. Rand, R.N., The Public Health Nurse and the County Doctors, *The Echo*—Virginia State Health Dept., IV: 150 (June), 1929.

If there is no family physician or if he is not available, every effort should surely be made to conserve the best interests of the patient.

Health Day at a Teachers' Institute—In Indiana the superintendent of schools in each county arranges a 3-day institute for all teachers in the county schools. These institutes are generally held the week before school begins in the fall. The public health nurse usually has to be content with from 15 minutes to an hour of the program time to explain her health plans for the coming year to the teachers, and she always has an exhibit of health material at the meeting.

This year the school nurse in Randolph County prevailed upon the County Superintendent of Schools to allow her to have one whole day of the institute for a health program. She has arranged to give a demonstration of a teacher's morning inspection of pupils, and following this there will be a discussion of the teacher's part in the health program. Then she has ar-

ranged to have a man prominent in this particular field speak for an hour on the subject "The Subnormal Child." In the afternoon there will be a lecture on Health Education by a teacher from a neighboring state who has done outstanding work in this line, and for the last thing on the program the State Health Commissioner will address the teachers on "The Modern Control of Communicable Disease." There will be plenty of time for questions and discussions after each address.

A novel feature of the meeting will be a session for school janitors and the State Health Commissioner will address them on School Sanitation. This county has eighteen consolidated schools and no one room rural schools, so that every school has a janitor, and each janitor has promised to come to the meeting.

School **Nursing as a Career**—The old idea of school nursing emphasized the negative aspects of the health program, and consisted mainly of detecting cases of contagion and physical defects and making home visits to try to persuade the parents to secure corrections.

The modern school health problem is a positive thing—it tries to develop fine children and reaches every child in school. Now, however, the school nurse is only one participant in a big school health program, and the effectiveness of her contribution depends on the willing coöperation she receives from the teaching staff in the school and her coworkers in the community.

The school nurse acts as the representative of the commissioner of health in her school contacts, and in matters that concern health should be the consultant and adviser of the superintendent of schools.

The first personal qualification a school nurse should have is good health, both mental and physical, and this should mean that she has a good store of energy and is good natured. She must also have a genuine love of people.

On the professional side she should be a high school graduate, and have her nurse's training in a hospital nursing school of high standing. On top of this, a generalized training in public health nursing, as postgraduate work, is necessary. In her public health course she should have plenty of opportunity to study normal children to enable her to handle better the usual childhood problems.

Skill in newspaper and general publicity methods will be of great value to the nurse in interpreting the needs of child health in the community. Teacher training and experience are extremely valuable to her as she is always a teacher herself and this training helps her to appreciate the teacher's problems in the classroom.

There is great need of school nurses with good educational background to do research work in the correlating of regular school subjects with the school health program.

The following are some problems in school health work where a school nurse's research work would make valuable contributions to both modern educational and preventive health methods:

1. Causes of absences of school children
2. How best to control contagious disease
3. Effect of extra nourishment on underweight children
4. Progress of individual children who present peculiar difficulties
5. Comparison of health of children who live in coöperative and incoöperative homes

A school nurse who sees her opportunities can be an unlimited influence for good in a community and especially in the lives of its boys and girls.—Elma Rood, School Nursing as a Career, *J. Nat. Ed. Assn.*, 18, 5: 147 (May), 1929.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Meet the Editor at Minneapolis—What was best in your publicity last year? In what did you fail or have but moderate success? What experiments have you made? What tests? What new methods, or old methods tried in a new way? What questions do you want answered?

The editor of this department and associates in the Public Health Education Section will be at Education-Publicity Headquarters most of the time between section meetings. Join the group—to give to others, to glean for yourself. Consultations with specialists will be arranged for all who wish them.

What Will You Send to Minneapolis?—Will you send leaflets, folders, booklets, posters? Educational or money-raising letters? Posters, placards, car cards? Copies of radio talks? Topics for health speakers? Slogans or titles? News stories or news photographs? Lists of publications available? Lists of pictures or exhibits? Campaign scrap books?

What have you? A single piece of printed matter, or a varied collection of publicity material? *Please write quickly for instructions,* addressing the chairman of Headquarters and Exhibit Committee, Evart G. Routzahn, 130 East 22d Street, New York, N. Y.

Matter for free distribution should be addressed:

Free Distribution
Education-Publicity Headquarters
Minneapolis Auditorium
Minneapolis, Minn.

But please write in advance if you expect to send anything for the classified display at headquarters.

If They Do or If They Don't—In any case the A. P. H. A. meeting in Minneapolis is an opportunity of significance.

If staff workers know all about their jobs in publicity or health education, Minneapolis will be an opportunity to share with others.

If staff members lack knowledge or experience, a few days at Minneapolis will be the best possible investment of department or association funds.

Those who handle motion pictures or send out exhibits, those who get up printed matter or distribute it, those who deal with newspapers, and those who work with the schools—all will find much at Minneapolis that they can use in "their business."

What Shall Be Told?—How much should the public be told about vitamins? What is it reasonable to say about brushing the teeth? What exaggerations and mis-information on health topics are found in current advertising and health publicity?

You are invited to submit material, either your own—for approval, of course—or some from another source of which you disapprove, to the clinic on "What to Tell." Much attention has been given in past meetings to ways and means of making health information interesting, clear and convincing. At one meeting of the Public Health Education Section in Minneapolis the intention is to go behind the form of presentation and discuss the subject

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

matter—what facts need greater emphasis, what statements, although essentially true, are misleading; in other words, what the public should and should not be told in 1929. Please send good and bad examples to the editor of this department as soon as possible.

Study Exhibits in Action—The popular health exhibition, which will be held in the main auditorium as a feature of the A. P. H. A. meeting at Minneapolis, is intended to appeal chiefly to the lay public. The exhibition will be widely advertised in and about Minneapolis and a large attendance is expected of persons to whom popular health education is addressed.

Here is an unusual opportunity for those engaged in health education to study exhibits in use, noting the response of visitors to different methods of display and to different subject matter. The exhibits are being prepared by public and private health agencies of Minnesota under the direction of Richard O. Beard, M.D.

For the Head-line Reader—Statistics do not always lend themselves to picturesque comparisons, or to other forms of simplification which help to make the average reader grasp their significance. Perhaps the following bewildering sequence of percentages must stand as it is:

> Practically 62 per cent of all surgical cases remained in the hospital less than 11 days while only about 43 per cent of the medical cases stayed less than 11 days. Most of the obstetrical cases come within the 11–19 day period, while the highest percentage of cases requiring more than 20 days is to be found in medical cases where nearly 42 per cent of them require more than 20 days as compared with 17 per cent of surgical cases and 3 per cent obstetrical cases.

Blue pencil about half the words in those two sentences, and the statistical facts will stand out more clearly. Why not try this form: "Six in 10 surgical cases left the hospital in less than 11 days"?

In contrast to the above is the opening sentence of a news story on a similar report:

> The average New Yorker, entering a local hospital at 9 o'clock next Monday morning as a sick man, will be discharged at 6:27 p.m. on the second following Wednesday, according to a survey just completed by officials of the United Hospital Fund. . . .

The Illinois Department of Health (press release dated July 14, 1929) makes graphic the cost of smallpox:

> Spending together more than 300 years in quarantine is what 5,400 people have already done this year in Illinois because of smallpox. The State Department of Health has spent about $67,000 for the same reason. Nobody wants the disease and nobody wants to be vaccinated. Hundreds of years in quarantine and thousands of dollars in useless expense is the result.
>
> So far about 2,700 cases of smallpox have been reported in Illinois this year. For each case at least two people have been under quarantine for no less than 21 days. Travel and salary of state health authorities for all time spent in combatting smallpox amounts to an average of about $25.00 per case. Three or four thousand cases of smallpox per year, therefore, costs a sizeable sum and causes no insignificant number of people to spend a considerable amount of time in almost solitary confinement.

A Governor Looks at Public Health—Said Governor Franklin D. Roosevelt at the recent Annual Conference of Health Officers and Public Health Nurses of New York:

> . . . In the final analysis public health must depend on the locality. Today in county after county the average amount spent for health improvement is under 50 cents per capita, while those same counties spend $4, $5, and $6 for improvement of highways. This is just an example. I do not want the highway work to stop, but the proportion is out of line if we figure it on the population and the future generation. . . .
>
> Some of the widely scattered rural counties are doing better work than those containing large civic communities. It comes down to the interest aroused among the people themselves. . . . If we can obtain from the indi-

viduals of the electorate the right to see that the health of communities is kept up to the best modern standards we will be doing a fine piece of work.

The Thirteenth National Baby Week—In July, 1929, England celebrated the thirteenth consecutive annual National Baby Week.

In the development of its activities the Council found that in addition to the one week's intensive campaign during the first week in July, local Baby Weeks became very influential and important. These local campaigns were and still are being held at various periods throughout the year—at times found to be the most favourable to the area concerned in the campaign. The National Baby Week Council reports yearly an increasing number of these local baby weeks.

DATES AHEAD

Nov. 11–17—"American Education Week." Address: National Education Association, Washington, D. C.

REGRETTABLE BUT TRUE

That one city department of health devoted a dozen pages to "Causes of Death" and other statistical matter—followed by three pages of interesting text. Why not reverse the arrangement?

WORDS

Few people have a "physician." Most people "go to a doctor." Is there a weak spot in the health examination campaigning in the repeated urging to see "*your* physician"?

"Human and animal *dejecta*"; "*focus* of infection"; "water courses *traversing* or draining inhibited regions"; "contaminated by *human feces*."—A state department press release.

"The variations in temperature, both seasonal and *diurnal*." In a radio talk.

An Explanation with Regrets—A seven weeks' absence from the office—the longest period away from business in ten years or more—is responsible for the absence of this department from one issue of the JOURNAL. The editor deeply regrets his inability to prepare copy in advance.

The department will appear as usual in subsequent issues.

BOOKS AND REPORTS

A Lost Commander. Florence Nightingale—*By Mary Raymond Shipman Andrews. New York: Doubleday, Doran,* 1929. 299 pp. Price, $3.00.

In the pages of the glamorous story of public health, Florence Nightingale deserves an exalted place. As the founder of modern nursing, her dramatic career has been the inspiration for a legion of women whose lives have been consecrated to healing the sick or carrying to the people the gospel of good health. The narrative has been told many times and it is one with which every sanitarian should be familiar.

This particular retelling of what ought to be a well-known tale is the work of a trained novelist turned biographer. The book is competently, at times beautifully, written, but it also bears some of the marks of journalism. The first chapter, for example, rather effusively, if effectively, describes a romantic incident which has never been authenticated, as the author admits. The second chapter is inclined to be equally imaginative, but after that the book swings into facts, such as the glorious story of Scutari, where "the Lady with the Lamp" rendered her first conspicuous service.

Notable as she was in the Victorian era, Florence Nightingale was no plaster saint, though certainly not the disagreeable martinet she has been painted in the bilious biography of the cynical Strachey. There seems, however, a tendency toward glorification in this book by Mrs. Andrews. Nor was Miss Nightingale a "lost commander," but a truly great leader whose influence on English progress in certain fields, such as sanitation, hospitals, nursing, and even medicine, was tremendous—and lasting.

The book is a pleasure to read, not only for its excellent content, but because of the attractiveness with which it has been printed.

"There were many facets to that diamond called Florence Nightingale," says the author. There were indeed; but the really brilliant narrative of her life remains to be told. Capable and interesting as is this one, a better will be written some day, not by invitation from a metropolitan publishing house, nor on the whim of an established writer, but by some obscure nurse or sanitarian who has lived the same romance that was the life of the Lady with the Lamp. JAMES A. TOBEY

Ergebnisse der Sozialen Hygiene und Gesundheitsfürsorge—*Edited by Prof. Dr. A. Grotjahn, Professor of Social Hygiene, Prof. Dr. L. Langstein, Professor of Children's Diseases, and Prof. Dr. F. Rott, Docent in Social Hygiene, the University of Berlin. Leipzig: G. Thieme,* 1929. Vol. 1, viii + 440 pp., 31 figs. Price, M. 30, bound, M. 33.

The aim of this new journal in the field of social hygiene is to present trustworthy and critical summaries by competent specialists of the progress made in the various subdivisions of this rapidly advancing science, and in its applications. It aims to summarize the results of fundamental investigations, of the more specialized aspects of social hygiene, and of the borderlands of this subject. It aims to meet the needs of investigators and of physicians engaged in social insurance, of those in the clinical and laboratory fields, and of those

interested in the organization and administration of measures of social hygiene.

It aims to represent the fields of eugenics and reproduction, constitutional and anthropometric investigations, hygiene and sanitation, education in hygiene, vital statistics and population changes, control of epidemics and sanitary legislation, social insurance and health promotion, social hygiene for mothers, children, youths, and the aged, care of cripples, the tuberculous, and those with venereal disease, social psychiatry and psychopathic enterprises, prevention of alcoholism and narcotism, social statistics, hospital facilities and hospitalization, the relations of health measures to the growth of public and private interest in the promotion of social hygiene.

The first volume has 12 special summaries by specialists, dealing with such subjects as the decline in infant mortality, contraception, sterility and mortality in the districts of Berlin, with reference to their social composition, school dental service as a community health measure, and the theoretical program of social hygiene. American readers will be interested in Dr. Béla Schick's discussion of protective immunization against diphtheria in the United States.

This new addition to the "Ergebnisse" of the German scientific press fills a distinct need in a growing field, especially that created by the growth of social efforts along the line of preventive medicine. C. A. KOFOID

Foods of the Foreign-Born in Relation to Health—*By Bertha M. Wood. Boston: Barrows. (2d ed.)* 1929. 110 pp. Price, $1.25.

Diets employed in hospitals and institutions and those recommended at clinics and dispensaries serving large numbers of foreign born persons ought to be adapted, within the limits of sound nutrition, to the dietary habits of the different nationalities served. In order to do this satisfactorily, it is, of course, essential for doctors and dietitians, nurses and social workers, to know something about the food customs of the various racial groups.

In this little book the author presents much useful information about the foods of Mexicans, Portuguese, Italians, Hungarians, Poles and other Slavic peoples, Near East peoples, and Jews. Suggestions are also made regarding therapeutic diets for special purposes. In these days of frenzied prohibition it is interesting to read that the daily diet of the Hungarians in their own country contains whisky and that these combinations do not change much here. Probably not.

A new appendix in the second edition, which has been published about 7 years after the first, gives the proportions of protein, fat, and carbohydrate in the various food combinations mentioned throughout the text. If it also gave the minerals and vitamin content, it would possess much greater nutritional significance.

The book is fairly well printed and has an index of recipes. There is a foreword by M. M. Davis, written in 1921. This book ought to be useful for its purpose. JAMES A. TOBEY

Communicable Diseases for Nurses—*By Albert G. Bower, M.D., and Edith B. Pilant, R.N. Philadelphia: Saunders,* 1929. 327 pp. Price, $3.00.

This book seems to give all the information in regard to communicable diseases found in the most up-to-date books on the subject designed for public health workers, with the additional distinction of laying most emphasis on practical nursing technic and care in the treatment of these diseases.

The authors state that acquired active immunity from diphtheria is still

in an experimental stage, when 8 or 10 cities in the United States have reduced their death rate from diphtheria to almost zero by the widespread use of toxin-antitoxin. The authors also state that large doses of toxin-antitoxin may be given and repeated as often as necessary to obtain results, when it has been thought that the best method is to give the one large maximum dose in the first place and obviate the necessity of repeated doses.

This is a valuable book for not only nurses but housewives, and even physicians, to possess. It is easy reading, has a good glossary and good illustrations, some of them in colors.

EVA F. MACDOUGALL

The Struggle for Health—*By Richard H. Hoffman, M.D. New York: Liveright,* 1929. 341 pp. Price, $3.50.

The most conspicuous struggle here is the laborious endeavor of the author to present the entire history of medicine for popular consumption. The result is a somewhat ponderous, closely printed volume which depicts, with many collateral remarks obviously intended to be clever, the development of medicine from the days of Pithecanthropus Erectus to Freud.

Despite a dull beginning, much of the book is entertaining, especially when the author drifts into anecdote. In the apparent attempt to include every detail, however, much of the material becomes a mere catalog of facts, an array which gets bewildering rather than fascinating, as the subject warrants.

The book displays a rather poor sense of relative values in the story of health. Thus, Pasteur, the founder of modern preventive medicine, who deserves at least a whole chapter in any such work, is accorded only about 4 pages, just half the space devoted to Aureolus Theophrastus Bombast von Hohenheim, commonly called Paracelsus, who was as much a charlatan as anything else. Similarly, Lord Lister and Florence Nightingale are honored here with only a page each. In the chapter on mental hygiene there is no mention at all of Dorothea Dix or Beers, and only a sentence or two on Pinel.

This lack of balance is further accentuated by a sudden transition from historical narrative to a discourse on the internal secretions, forming Chapter XV, which is, moreover, one of the most interesting parts of the book. In a chapter on X-ray there are several pages on nutrition, in which only 3 of the 6 or more known vitamins are described, though the book was obviously written quite recently.

This book is well printed with respect to freedom from typographical errors, but the print is several points too small. By what process of logic does a publisher issue a book on a health topic with print that might cause eye strain in many sensitive readers? Such a poor conception of hygiene deserves condemnation.

The sanitarian directly interested in medical history may find this book of value, and the layman may derive some entertainment from it, but there are many standard works not yet improved upon which are available to either group of readers. This one is not "the" struggle for health, but a struggle.

JAMES A. TOBEY

The Physical Welfare of the School Child—*By Charles H. Keene, M.D. Boston: Houghton, Mifflin,* 1929. 505 pp. Price, $2.40.

Books of substance and "easy reading" qualities are always sure of readers, especially in the field of public health. This new book by Keene is full of valuable material, simply written, and has a good index.

The plan of the book is to set forth

"the threefold duty of the school" (protection, correction and prevention) through a discussion of the "seven parts of a unified program": sanitation of the school plant; physical education; health supervision; hygienic arrangement of the school program; health of teachers; training of teachers; health training and instruction. These subdivisions are not treated exhaustively, of course, but in sufficient detail for the purpose. References are constantly given to sources of more extensive treatment of the given topic.

So much for a few of the obvious strong points of the book, of which there are many. It is a book written by a man of wide experience and strong convictions—both experience and convictions are very evident. The reviewer has the uneasy feeling that in spots the book may convey to the inexperienced student in normal school or college a sense of finality concerning certain highly controversial subjects which transcend the public health field and get into that of economics, of government or what not. Some will wonder whether it is entirely in accord with sound public policy to turn our public schools into surgical dispensaries where the child has his teeth filled, pulled, straightened; his tonsils snatched from him; his eyes treated—all at public expense.

Somewhat disproportionate space is given to the question of who should administer the health supervision program in the schools, the stand being taken that unquestionably it belongs almost solely to the educational authorities. As a matter of fact, it is usually carried out equally badly by school or health department. Both, on the other hand, would seem to have responsibilities toward the school child which cannot be dodged.

What has been said above concerning certain controversial aspects of the book merely indicates that it is stimulating, and heaven is always to be praised for a stimulating book. The reviewer heartily recommends it to school physicians, nurses, public health workers in general, as well as to discriminating students in college or normal school.

MERRILL E. CHAMPION

Morphologic Variation and the Rate of Growth of Bacteria—*By Arthur T. Henrici, University of Minnesota. Springfield, Ill.: Charles C. Thomas.* 194 pp. Price, $3.00.

As a source of comfort this contribution of Henrici's should be welcome to both camps of the forces battling over the subject of bacterial variation. As a result of tedious but careful research aided by clear and accurate analysis this author has furnished a new basis for consideration of the problems related to the fixity of bacterial species and the study of "life cycles." The work is primarily concerned with studies of the early stages of bacterial growth in which it is shown changes fully as significant as those occurring in old cultures are invariably found. Enumeration, measurement, and study of morphology of bacterial cells has been carried on throughout the entire period of bacterial growth, and by judicious use of statistical methods the conclusion has been reached that "morphologic variations of bacteria are an expression of the variations in growth rate."

It is not within the province of the reviewer to evaluate the experiments performed, nor to comment upon the significance of the conclusions reached. It is sufficient to state that this contribution warrants very careful study by all who are interested in the subject of bacterial variation.

Certain features of the monograph deserve special mention however. The publications of such workers as Lohnis, Enderlein, Almquist, Mellon and others relating to life cycles in bacteria are so confusing to many readers, partly be-

cause of the multiplicity of terms, as to render comparison and evaluation difficult if not impossible. Henrici in his opening chapter reviews this literature in a clear and concise manner, and leaves one with a very clear understanding of the present status of the problem. The remainder of the book is concerned with a report of the experiments performed and an analysis of the results obtained. One is impressed with the extent of the researches involved, with the ingenuity of the methods used, and with the excellence of the analyses given. The writer can scarcely be accused of being dogmatic although his conclusions support the monomorphistic view. He does not deny the existence of life cycles, but logically points out the conditions which must be met before such sexual development of bacteria can be accepted as proved.

The book is well written, well indexed and typographically pleasing.

N. W. LARKUM

A Manual of Helminthology—*By H. A. Baylis. New York: William Wood*, 1929. 303 pp., 200 figs. Price, $10.00.

This is a very welcome and valuable manual of the parasitic trematodes, cestodes, nematodes and related round worms known to occur in man and in the domesticated animals of temperate regions and the tropics. It will be an exceedingly useful work since there has been much written in these fields in recent years and the literature of the subject is widely scattered in many journals difficult of access except in the few great libraries of the world. The author's access to the library and the collections of the British Museum has given him exceptional facilities. His work is a synoptic treatment, with brief but well set-up accounts of the genuses and species of these parasitic worms of medical and veterinary interest. There are many new illustrations and good host parasite lists. It is of interest to note in these lists that man has to his credit as parasites 30 flukes or trematodes, 28 tape worms or cestodes, 58 nematodes or round worms and 3 Acanthocephala or thorny-headed worms, a larger number than any one of his domesticated animals has acquired. Possibly this is an index of medical as against veterinary interests in parasitology rather than an indication of differential sanitation or species susceptibility to infection.

C. A. KOFOID

Everyday Doings in Healthville—*By Emma Serl. New York: Silver, Burdett*, 1929. 128 pp. Price, $.68.

The fundamental health activities which should be carried out in the daily routine life of every child are emphasized in story form. The animal characters, Bettie and Bobbie Squirrel, have been personified by the author as inhabitants of Healthville in a manner which will interest the primary grade child.

This supplementary reader has been illustrated by Harry E. Wood, whose illustrations of children's books have created much favorable comment lately.

ANNA B. TOWSE

Guide for a Health Program—*By Jessie I. Lummis and Willidell Schawe. Yonkers, N. Y.: World Book Co.*, 1929. 196 pp. Price, $1.24.

The authors, who have recently contributed a series of health readers to the meager supply of health education material, have prepared this teacher's manual for the first, second and third grades. Teachers of health education will welcome this additional aid of detailed activities for a health education program and the reasons thereof. The manual is profusely illustrated and carries a section listing the materials that can be obtained for use in the schoolroom.

ANNA B. TOWSE

Psychiatry in Industry—*By V. V. Anderson, M.D., M.A., Director of Medical Research, the R. H. Macy & Co., Inc. New York: Harper,* 1929. 364 pp. Price, $4.00.

A book in this field from the psychiatrist's standpoint which also deals extensively with industrial psychology is welcomed. Four years of personnel problems in one of the largest mercantile establishments of the country where the employment office handles 15,000 cases a year, with the aid also of psychiatric social workers, has afforded a considerable experience. The book contains many summaries, extensive case discussions, the relative values of various mental tests along with their descriptions, the application of psychiatry to administrative methods, and a pleasing touch of somewhat philosophical observations. Psychological tests are found to have but a limited part in adequate job placement while a thorough medical and psychiatric study comes nearer solving the problem.

Radical changes in personnel and duties in different departments of the business were brought about with resulting great improvements through the methods used.

The chapter on health is devoted to chronic hospital users, compensation and sick leave cases, situation-reaction cases, fatigue problems, and frank cases of nervous and mental disturbances. Practically nothing is mentioned of associated physical findings and medical treatment so that one is a little skeptical whether, for instance, the 35-year old female described on pages 160–164 who had "nothing of importance except 20 pounds underweight" and complained of a group of symptoms suggestive of a toxicosis, possibly endocrinal, was entirely a psychoneurotic. Where the usual hospital experience reports about 25 per cent of patients suffering from neuroses, the author is convinced there is a much larger percentage in the rank and file. About 9 per cent of those examined physically for employment were rejected because of physical disorders.

Rather striking results of the psychiatric handling of the firm's automobile drivers are described. Among 450 of these there occurred a monthly reduction of 50–82 per cent in accidents, and a decrease of 92 per cent in labor turnover within one year, apparently consequent upon the tests. However, the reviewer feels this field is still too new to accept too great positivity of statement as to cause and effect.

There is an index, but no bibliography, although a half-dozen references are mentioned as of value for employment reviewers on page 193. The type is large, the reading easy and of excellent literary style. An appendix shows the inquiry forms and sample tests used. The book should appeal to professional and business men and to students as well as to all interested in personnel problems. EMERY R. HAYHURST

An Hour on Health—*By Morris Fishbein, M.D. Philadelphia: Lippincott,* 1929. 158 pp. Price, $1.00.

This little book belongs to the "One Hour Series," and one may well spend more than that time on its perusal. Beginning with the question of the length of life, which interests everyone, even those who profess a great desire to depart from this wicked world and enter the realms of the blessed, it covers in succession a number of subjects relating to health.

Perhaps the outstanding feature of the book is the attack on fads which are treated both with humor and philosophy. The faddists and the fakers understand human nature better than the average of their fellowmen. The author emphasizes this point in saying that is doubtful if any religious cult could achieve complete success unless it laid stress either on food or sex. We

agree with him that practically all faddists take themselves too seriously, and develop their special twists at the expense of the rest of their nature. Certainly the average faddist of any kind is an intolerable bore.

The book is easy reading, generally sound, and within its scope can be recommended. M. P. RAVENEL

Aerztliche Sachverständigen-Tätigkeit auf dem Gebiete der Hygiene—*Von Geh. Med.-Rat. Dr. O. Solbrig. Berlin: Urban & Schwarzenberg,* 1929. xii + 514 pp., 47 figs. Price, M. 33 (Bound, M. 39).

This is Volume 10, part 2, of Dr. Dittrich's series of informational professional handbooks and deals with hygiene, largely from the standpoint of sanitation and sanitary engineering, with minor attention to personal hygiene. The first section deals with soil in relation to air, water, and bacteria; water, its sources, physical and chemical properties, and its biological and bacteriological examination and control; mineral waters and ice. The second is concerned with nutrition, the sources of food, animal and vegetable, and of stimulants, clothing, and dangers to health from dirt, poisons, and dyes; and with dwellings, with special reference to factors of material, construction and arrangement as these affect health, and sanitary precautions in heating, lighting and ventilation.

The third chapter is concerned with municipal hygiene, city planning of residential districts and public institutions, transportation by ship and rail; water supply, sources, purification, removal of iron and manganese, softening, and organization and equipment of a scientific water control system; sewage disposal by various mechanical and biological methods, intermittent filtration, activated sludge, etc.; domestic systems, disinfection and methods of investigation; and a final section on mass feeding of children, soldiers, prisoners, the care of people's kitchens, consumers' coöperatives, municipal markets, abattoirs, supervision of the traffic in foods and inspection of imports.

The closing chapter deals with school and industrial hygiene. The former is treated from the standpoint, first of the buildings, their construction and care, and second from that of the personal hygiene of the pupil and the function of the school physician and dentist.

Industrial hygiene is discussed in its generalities, such as dust, gases, hours of labor, women and children in industry. There follows a detailed discussion of the various subdivisions of trades and industries which have reached so wide a diversification in modern industrial Germany. The work is replete with information, very well organized, significantly illustrated, and comprehensive in scope. It gives an excellent picture of the best German practice in hygienic matters where the sanitary engineer and public health physician are concerned.

C. A. KOFOID

Laboratory Directions in College Zoology—*By Henry Lane Bruner. New York: Macmillan,* 1928. 163 pp. Price, $1.40.

This is the laboratory outline accompanying the elementary course in zoology at Butler University. It follows the usual outline of a progressive survey of animal types from amebas—in this case not to man, but to the pigeon—with an introductory exercise on protoplasmic circulation in *Elodea.*

The course is planned for a year's work with two laboratory sections weekly. The invertebrates studied include the tape worm and *Ascaris.* Considerable attention is given to the physiological relations of the organs studied.

C. A. KOFOID

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

New Jersey—This 51st annual report reviews at the outset the morbidity and mortality data for the year 1927, and shows a death rate of 11.4, the lowest ever recorded for this state. In 66 communities, representatives of the State Health Department assisted local health and educational bodies by introducing the subject of diphtheria immunization to the public, exhibiting motion pictures, supplying literature and record forms, and conducting clinics. It is estimated that throughout the state 173,000 children have been immunized in public clinics, not including those who were immunized by physicians in their private practice. This is one-fifth of the susceptible children in the state.

An epidemiological study of an outbreak of paratyphoid fever proved it to be transmitted through unpasteurized milk. Further spread of the disease was promptly prevented when department representatives stopped the sale of raw milk. A typhoid fever outbreak was also traced to a raw milk supply. In last year's report, reference was made to an extensive outbreak of scarlet fever (more than 200 cases). As usual, a missed human case of the disease was considered responsible. An unusual feature was that a cow in a certain dairy herd developed inflammation of the udder which yielded hemolytic streptococci.

Studies of the organism isolated from the milk showed it to be indistinguishable from the streptococcus of scarlet fever. "The udder infection appears to be the logical explanation of the massive infection of the milk, and stresses anew the importance of pasteurization."

The infant mortality rate of the state continues to decline, and 18 communities have adopted the department's continuous child hygiene program. In an attempt to determine upon a practical maternity hygiene plan suitable for municipal health department practice, the Bureau of Child Hygiene has set up an experimental prenatal center where a 5-year program will be carried out. The report abounds in good statistical tables and charts with appropriate descriptive text.

Rockford, Ill.—Rockford reports for 1928 a population of 83,700, a death rate of 9.18, a birth rate of 15.7, and an infant mortality rate (all rates corrected for residence) of 36.07. Vital statistics are analyzed in considerable detail. This annual report is made attractive by the use of organization charts, graphs and special cuts, with statistical data accompanied by descriptive text.

It is gratifying to note that over 98.8 per cent of the milk supply is pasteurized. Continued progress in the control of communicable disease is noted, including tuberculosis. In 1901, there was a tuberculosis rate of 169 as compared with 48 in 1928. In September, 1928, a tornado resulted in 14 deaths, with over 100 accidental injuries. City and county officials cooperated in public health, first aid and rehabilitation work following this catastrophe. A classified financial statement indicates an expenditure of $33,134 by the health department, in addition to expenditures by voluntary agencies whose coöperation is acknowledged.

New Brunswick Province—The 1928 report of this province is of special interest on account of the attention given to problems of mental hygiene, infant welfare, tuberculosis control, and a plan for county health units. Con-

siderable progress is being made in lowering the infant mortality and tuberculosis rates, and consideration is being given to the possibility of instituting a coöperative plan with the federal government for county health units. A comprehensive statement of health department activities is made by the medical officer, and this is followed by more detailed bureau reports which abound in well prepared statistical tables.

A birth rate of 25.5, a marriage rate of 7.0, and a death rate of 11.9 per 1,000 population are recorded. The infant mortality rate has dropped from 134.9 in 1920 to 96.0 in 1928. The estimated population of the province is 411,000.

Ottawa—This city, with a population of 122,731, reports for 1928 a birth rate of 24.8, a death rate (corrected) of 11.06, and an infant mortality rate of 104.07. Smallpox reached epidemic proportions during the last 2 months of 1927, and January of 1928, cases being chiefly among adults and preschool children. During 1928, there were 382 cases reported, with no deaths, 286 having been treated in hospital. Tuberculosis continued to decline, a death rate of 73 being recorded, 82 per cent of the deaths being of pulmonary form. The report contains many statistical tables, the analyses of vital statistics by age, sex, and nationality being of special interest.

Pennsylvania Milk Inspectors—To health officers and milk control officials, the 224-page report for 1929 of the Pennsylvania Association of Dairy and Milk Inspectors will prove valuable. Papers deal with bovine tuberculosis eradication work, undulant fever, arrangement and remodeling of dairy barns, clean and safe milk for small communities, heat-resistant and heat-loving bacteria, coöperation between states regarding conditions surrounding the production of milk for interstate shipment, recording thermometers, ordinances, and pasteurization problems.

Lorain County, O.—Printed on good paper, with a soft green, well designed cover, this 1928 report for a county health district of 33,571 inhabitants occupies 41 pages. In a foreword, the health commissioner outlines important features of the district and its health organization. This district comprises 10 villages and 20 townships, with a land area of 476 square miles. In addition to the board of health of 5 members, there is a district advisory council, which consists of the mayors of the 10 villages and the chairmen of the boards of trustees of the 20 townships. Besides the medical health commissioner, the personnel consists of a deputy commissioner, a part-time school physician, 3 public health nurses, a bacteriologist-chemist, and a clerk. The budget, as shown by a classified statement, amounts to 58 cents per capita.

A crude death rate of 12, a birth rate of 14.9, and an infant mortality rate of 48.1 are recorded for the year. As considerable toxin-antitoxin work had been done, it was decided to perform Schick tests on a group of 1,789 school children. Of 1,046 who had received 3 or more T–A injections, 77.6 per cent gave negative Schick tests, while of 671 who had received no injections, 30.7 per cent gave negative results. There were 72 children who had received one or two injections, and of these 59.8 per cent gave negative reactions. The intervals between last injections and Schick tests are not stated.

Among the outstanding features of the year are noted the following: Six employees traveled over 50,000 miles in connection with the work. Three nurses made 28,800 inspections of school children, and 2,898 visits of various kinds to homes and schools. The

bacteriologist analyzed 3,194 specimens and made 189 dairy farm and milk plant inspections. Over 49,000 pieces of mimeographed material were distributed by the department, and 94 health talks were given to Parent-Teacher organizations and civic clubs, in addition to 539 health talks to school groups.

Tennessee—One of the best state health department reports received this year is that of Tennessee for 1926–1927. The report opens with an enlightening statement regarding general policy, and the responsibility of state and county governments.

> There is, therefore, no more fundamental responsibility of government, considered from the economic point of view only, than the responsibility to serve and to protect the public health. . . . The State Department of Public Health in Tennessee is committed to a policy which recognizes local responsibility for public health activity and that the health program for the state as a whole must be built on a solid foundation of well organized, effective local full-time health departments organized under trained leadership and manned by trained personnel.

Extension of local rural health work through full-time county departments is being stimulated.

A second major element is that the state department shall so organize its own activity as to render expert consultant service to local departments of public health and act as a coördinating influence in the development of a common program of activity and high standards of service for local health agencies. A third element provides for leadership rather than compulsion, and a fourth for a recognition of the fundamental contribution to public health progress which can be made by the practicing physician.

Following a summary of health conditions, the report takes up the work of various divisions, including administration, local organization, epidemiology, vital statistics, laboratories, sanitary engineering, child hygiene and public health nursing, and health education. This most important phase of public health work (health education) is now receiving due attention by the department. A director has been secured and educational material covering all subjects pertaining to public health has been prepared. Plans are under way for the coördination and further extension of health instruction in the educational institutions of the state. The attractiveness of the report is increased by the careful preparation and selection of good statistical tables, charts, and photographs, which add interest to the text.

BOOKS RECEIVED

THE MODERN BABY BOOK AND CHILD DEVELOPMENT RECORD. By John E. Anderson and Florence L. Goodenough. New York: Norton, 1929. 398 pp. Price, regular ed. $5.00; de luxe ed. $10.00.

REGIONAL PLAN OF NEW YORK AND ITS ENVIRONS. Vol. VIII. Physical Conditions and Public Services. New York: Committee on Regional Plan of New York and its Environs, 1929. 209 pp. Price, $3.00.

CHEMISTRY IN DAILY LIFE. By Samuel Glasstone. New York: Dutton, 1928. 250 pp. Price, $2.25.

RICKETS, INCLUDING OSTEOMALACIA AND TETANY. By Alfred F. Hess. Philadelphia: Lea & Febiger, 1929. 485 pp. Price, $5.50.

THE CHALLENGE OF CHRONIC DISEASES. By Ernst P. Boas and Nicholas Michelson. New York: Macmillan, 1929. 197 pp. Price, $2.50.

THE CHILD'S HEREDITY. By Paul Popenoe. Baltimore: Williams & Wilkins, 1929. 316 pp. Price, $2.00.

HEREDITY AND PARENTHOOD. By Samuel C. Schmucker. New York: Macmillan, 1929. 322 pp. Price, $2.50.

INCAPACITY OR DISABLEMENT IN ITS MEDICAL ASPECTS. By E. M. Brockbank. London: Lewis, 1926. 120 pp. Price, $2.00.

COMMUNITY RECREATION. By James Claude Elsom. New York: Century, 1929. 278 pp. Price, $7.25.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Before and After in Mental Hygiene—What people used to think and what they are now beginning to realize in child training are interestingly contrasted.

ANON. Old and New Version of Child Training, Ment. Hyg. Bull., 7, 6: 4 (June), 1929.

Progress in Nutrition—Another of Dr. Burnett's invaluable summaries of the work in nutrition throughout the preceding year. Excellent source material, especially for writers in this branch of health work.

BURNETT, F. L. Progress of Nutrition, New England J. Med., 200, 26: 1329 (June 27), 1929.

Preventing Tuberculosis with BCG—An answer to the statement that BCG may be virulent made by Petroff *et al.* Petroff's methods are questioned and his conclusions contradicted. Finally, the immunization of exposed infants is urged. Very emphatic throughout.

CALMETTE, A., and PLOTZ, H. Protective Inoculation against Tuberculosis with BCG, Am. Rev. Tuberc., 19, 6: 567 (June), 1929.

Maternal Mortality—That the problem of preventing needless maternal mortality is insistent everywhere is evidenced by this British discussion. What is done in that country is recounted, and the need of educating the public is stressed.

CASSIE, E. Maternal Mortality and Allied Problems, Pub. Health, 42, 10: 329 (July), 1929.

Infant Growth—The effect of cod liver oil added to diet suggests that the accepted standards of infant growth are too low.

DANIELS, A. L., *et al.* The Relation of Rate of Growth in Infants to Diet, Am. J. Dis. Child., 37, 6: 1177 (June), 1929.

Cancer, Urban and Rural—That *recorded* cancer deaths are probably lower in rural than in urban areas (after due correction for age composition of the population) is the conclusion of this interesting study of cancer mortality statistics in New York State.

DE PORTE, J. V. Extent to Which Residence Influences the Recorded Death Rates from Cancer in the State of New York, Am. J. Hyg., 10, 1: 201 (July), 1929.

School Room Ventilation—All who want to keep up-to-date on the schoolroom ventilation question will read with interest this latest statement of the secretary of the New York Commission.

DUFFIELD, T. J. The New York Commission on Ventilation. Quart. Bull. (Milbank Memorial Fund), 7, 3: 67 (July), 1929.

Urban vs. Rural Health—Relative changes in death rates urban and rural, and some of the probable causes are very interestingly presented.

EMERSON, H., and PHELPS, E. B. The City Gains on the Country, Survey Graphic, 42, 9: 469 (Aug. 1), 1929.

Undulant Fever—Another summary of our present-day knowledge of undulant fever, and a good one.

HASSELTINE, H. E. Current Studies in Undulant Fever, Pub. Health Rep., 44, 28: 1659 (July 12), 1929.

Epidemiology of Paratyphoid—An inclusive consideration of the differential diagnosis, epidemiologic investigation

and control measures for the paratyphoid group.

JORDAN, E. O. The Epidemiology of Paratyphoid Infections, J. Prev. Med., 3, 4: 279 (July), 1929.

Cancer Clinics—A committee report on methods of improving the service for cancer patients. The pioneering work in Massachusetts is covered in the survey.

EWING, J., *et al.* The Medical Service Available for Cancer Patients in the United States, J. A. M. A., 93, 3: 165 (July 20), 1929.

Lead Poisoning—How lead poisoning occurs in a storage battery plant and how it can be prevented is the theme of this exhaustive report. Periodic physical examinations can forestall acute poisoning.

GREENBURG, L., *et al.* A Study of Lead Poisoning in a Storage Battery Plant, Pub. Health Rep., 44, 28: 1666 (July 12), 1929.

Enuresis—That enuresis is a conduct disorder which can be stopped when the child so desires is the postulate of this paper. Other treatment than that of making the patient assume his responsibility is against the child's interest. Read it.

HAMILL, R. C. Enuresis, J. A. M. A., 93, 4: 254 (July 27), 1929.

Health Education for Children—The health educational methods employed in the Bellevue-Yorkville demonstration district cannot be summarized here, but that is unnecessary, for this paper will be read by all interested health workers.

LAMKIN, N. B., and DU PAUL, M. E. Health Education in Schools in the Metropolitan Health Demonstration Area, Quart. Bull. (Milbank Memorial Fund), 7, 3: 53 (July), 1929.

Body and Mind—One broad conclusion of this comprehensive study of Illinois children is that the number of physical defects decreases and the physical condition improves with the increase in the height of the I. Q. The authors wisely do not try to interpret this relationship.

KEMPF, G. A., and COLLINS, S. D. A Study of the Relation between Mental and Physical Status of Children in Two Counties in Illinois, Pub. Health Rep., 44, 29: 1743 (July 19), 1929.

Meat Diets—Two subjects (former arctic explorers) lived on an exclusive meat diet for a year with no ill effects—in fact, one subject's hair stopped falling out. Vegetarians take notice.

LIEB, C. W. The Effects on Human Beings of a Twelve Months' Exclusive Meat Diet, J. A. M. A., 93, 1: 20 (July 6), 1929.

Tuberculosis Immunization—Another paper upholding Calmette's claim that exposed children may safely be immunized against tuberculosis with BCG.

MAGUIRE, W. J. Early Immunization as a Preventive Measure against Tuberculosis, J. State Med., 37, 7: 421 (July), 1929.

Diphtheria in Palestine—The apparent absence of diphtheria combined with a high immunity rate can be accounted for only on the assumption that the disease is so mild as to be unrecognizable. Why the disease is not detected is being investigated. Very interesting.

MANN, M., and KLIGLER, I. J. The Schick Test in Palestine, a Country of Low Diphtheria Prevalence, J. Prev. Med., 3, 4: 309 (July), 1929.

Infant Mortality Causes—After scrutinizing the conditions within and without the infant which influence his ability to overcome the first year's hazards, the author proceeds to dissect the typical child hygiene program. Good for the soul.

SMITH, R. M. The Important Causes of Infant Mortality. Child Health Bull., 5, 4: 97 (July), 1929.

Endemic Typhus Fever—As there is endemic in the United States a disease resembling typhus which is not compatible with louse transmission from man to man, it must be that it is spread from some other source, probably some rodent, by a blood sucking parasite. An interesting speculation.

MAXCY, K. F. Typhus Fever in the United States, Pub. Health Rep., 44, 29: 1735 (July 19), 1929.

Meningitis Control Measures—An honestly pessimistic summary of experience in attempting to prevent the spread of this disease ending with the quotation from Rosenau that no measures so far taken have materially influenced the course of epidemics or prevented the spread of meningitis.

MCCOY, G. W. Meningococcus Meningitis and Measures for Its Control, Pub. Health Rep., 44, 27: 1595 (July 5), 1929.

Growing Bacteria—A method of growing bacteria in continuous culture was perfected for the production of large quantities of bacterial products. An ingenious apparatus.

MOYER, H. V. A Continuous Method of Culturing Bacteria for Chemical Study, J. Bact., 18, 1: 59 (July), 1929.

Industrial Hygiene—The record of the medical department of a small factory. All employees submitted voluntarily to the offered health examination, and 31 per cent of the discovered defects were corrected within the year.

MURRAY, H. G., and COOLIDGE, E. Health Work in Industry, New England J. Med., 200, 26: 1321 (June 27), 1929.

Reporting Children's Diseases—This supplementary report of the Hagerstown Morbidity Studies indicates that age is an important factor in completeness of reporting of children's diseases. It is suggested that morbidity statistics be used cautiously.

SYDENSTRICKER, E., and HEDRICH, A. W. Completeness of Reporting of Measles, Whooping Cough, and Chickenpox at Different Ages, Pub. Health Rep., 44, 26: 1537 (June 28), 1929.

Seasonal Diphtheria Immunity—The findings of an investigation which the authors believe tends to strengthen the probability that the fundamental factor in seasonal variation in diphtheria is the modification of individual resistance.

PERKINS, R. G., *et al.* Seasonal Variation of Diphtheria Antitoxin Content of the Blood of Adults and Adolescents, Am. J. Hyg., 10, 1: 13 (July), 1929.

Diet for the Aged—This paper should be read not only for the valuable lesson in applied common sense but because of the injection of the human touch—for lack of a better word—into technical writing.

RICE, T. B. A Balanced Ration for the Aged, Pub. Health Nurse, 31, 7: 356 (July), 1929.

Practitioners and Health Education—General practitioners are urged to participate in the health educational campaign in this rather rambling but none the less interesting discourse on public instruction in medicine.

ROBEY, W. H. Public Instruction in Medicine, New England J. Med., 200, 25: 1271 (June 20), 1929.

The Tuberculosis Patient—This appears to be the complete report of the study made to determine how much medical attention the early case of tuberculosis gets. Mention of the findings has been made in earlier papers. The need for periodic examinations of the apparently well is stressed.

WILLIAMS, L. R., and HILL, A. M. A Study of What Tuberculosis Patients Experience Prior to Their Admission to a Sanatorium, New England J. Med., 201, 2: 82 (July 11), 1929.

NEWS FROM THE FIELD

SNAKE BITE SERUM

THE New York State Health Department has distributed throughout the state a limited supply of antivenin serum for use in an emergency. This serum is used in case of bites from rattlesnakes, copperheads and water moccasins.

The supply is available at the State Laboratory at Albany; Bear Mountain headquarters of the Palisades Interstate Park, and at the district laboratory supply stations at Glens Falls, Binghampton and Haverstraw.

The department stated:

> Immediate administration of the serum is urged, and is probably essential, although it is said to be effective if given within from 12 to 24 hours after the bite.

"RABBIT FEVER" RECOGNIZED AS EXISTING IN RUSSIA

PROOF that tularaemia or "rabbit fever" is by no means confined to the United States is given in a report received by the U. S. Public Health Service which indicates the prevalence of the disease in Russia. The full text of a statement by the U. S. Public Health Service dealing with this subject and made public June 22, 1929, follows:

> That tularaemia is by no means confined to the United States is shown by a recent article in a foreign scientific journal which carries abstracts of articles which would indicate that tularaemia is coming to be recognized as existing in Russia. The original articles are by members of the staff of the State Institute of Microscopy and Epidemiology, at Saratov, for the S. E. of the Union of Socialistic Soviet Republics.

INSTITUTE FOR TUBERCULOSIS WORKERS

VANDERBILT University, in cooperation with the National Tuberculosis Association, will conduct an Institute for Tuberculosis Workers from September 10 to 24, 1929, at Nashville, Tenn. The Southern Conference on Tuberculosis, the Tennessee Tuberculosis Association and the Tennessee State Department of Health will also cooperate in this Institute.

> The Institute has four main objectives: to assist workers already in executive positions in the tuberculosis field to assume positions of great responsibility or to become more useful in their present positions; to prepare for executive positions those who have not had experience in the tuberculosis field; to give to volunteer workers a more comprehensive knowledge of the administrative problems involved in this work; to aid in the standardization of methods and programs of tuberculosis work.

MILK

ROME, Naples, Milan, and Verona have established milk centers where all milk intended for consumption in the city is sent for sterilization. At Italy's first conference on milk, held recently in Verona under government auspices, the fact was brought out that the annual consumption of milk per capita in Italy is only 15 quarts, while it is 90 quarts in England, 235 quarts in Germany, and 265 quarts in Sweden.

MENTAL HYGIENE CONGRESS

THE First International Congress on Mental Hygiene will be held in Washington, D. C., May 5 to 10, 1930. Twenty-six countries are already represented on the Committee on Organization, of which Arthur H. Ruggles, M.D., of Providence, R. I., is chairman.

Questions to be discussed at the Congress will include the relations of mental hygiene to law, to hospitals, to education, industry, social work, delinquency,

parenthood and community problems. A world-wide view of mental hygiene progress will be given.

It is the contention of those promoting the Congress that mental hygiene has to do with the conservation of mental health in general, not merely with nervous and mental disorders and diseases.

A NEW HEART LEAFLET

THE importance of physical examinations, the prevention of heart defects, and suggestions about how to live with an impaired heart are all included in a brief leaflet *Your Heart*. This is one of the health leaflet series issued free to health agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Mass.

BROOKLYN, N. Y., BOYCOTTS LOOSE MILK

GRADE B milk in all parts of Brooklyn, N. Y., with the exception of East New York, has recently been boycotted. This was announced by Daniel Gutman, counsel for the Greater New York Grocers' and Dairymen's Protective Association.

SUN-TAN

SHIRLEY W. Wynne, M.D., Commissioner of Health of New York City, warned the people recently, in a speech he gave over the radio, against getting too bad a sunburn for the sake of style. He said:

> When a person in the sun gets a peculiar sort of headache, becomes dizzy or nauseated, or notices that his skin is hot and dry, and that he is not perspiring as usual, it means that he must get out of the sun—and get out of it at once. If he pays no attention to these warnings, he will suddenly become unconscious and drop in his tracks.

The treatment in such a case, Dr. Wynne contended, is to call in a doctor, bring down the temperature of the patient by means of ice water, ice packs, cold showers, ice bags and cool sponges. He must rest for several days, avoiding the sun.

COMMONWEALTH FUND

THE Commonwealth Fund, which completed on June 30 a 5-year program for the development of child health services in Austria, announces the adoption of a new plan, to be put in operation on January 1, 1930, to promote rural health and medical service in the United States.

Unlike the Austrian project and the 4 child health demonstrations which the Fund has conducted in North Dakota, Tennessee, Georgia, and Oregon, the new undertaking will not stress child care. Its purpose will be rather to explore the possibility of bettering the whole range of health services in rural communities.

The Fund will center its effort in 2 states, yet to be selected, and in 2 counties or districts in each state where a sound beginning has already been made in local public health organization.

PERSONALS

PROFESSOR THOMAS WALTON GALLOWAY, member of the Division of Educational Measures of the American Social Hygiene Association, died on July 16, in New York, N. Y.

DR. WADE HAMILTON FROST, Surgeon of the U. S. Public Health Service, resigned from the Service. His resignation is effective beginning August 8, 1929.

GEORGE W. BARTELMEZ, Ph.D., has been promoted to a full professorship in anatomy at the University of Chicago, Chicago, Ill.

JACOB T. BUTZ, M.D., health officer of Allentown, Pa., has been elected President of the Pennsylvania Public Health Association.

DR. LESLIE ERNEST FUCHS, of Vienna, Austria, will be awarded the Leslie Dana Gold Medal for 1929, according to an announcement made by Lewis H. Carris of the National Society for the Prevention of Blindness.

DR. CHARLES MAYO, of Rochester, Minn., was awarded the degree of doctor of science, on June 23, at Leeds, England.

DR. JAMES L. MCCARTNEY has been appointed psychiatrist of the Connecticut State Department of Health.

DR. MARION LECOCQ, Lynden, Wash., has been reappointed County Health Officer, to serve a term of 2 years.

ISIDORE S. FALK, Ph.D., has been promoted to a full professorship in hygiene and bacteriology at the University of Chicago, Chicago, Ill.

CONFERENCES

Sept. 26–28, Association of Military Surgeons of the United States, Denver, Colo.

Sept. 30–Oct. 5, American Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, American Child Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, International Society of Medical Health Officers, Minneapolis, Minn.

Sept. 30–Oct. 5, American Association of School Physicians, Minneapolis, Minn.

Sept. 30–Oct. 5, Northwest Conference of Child Health and Parent Education, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Sanitary Conference, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Organization for Public Health Nursing, Minneapolis, Minn.

Sept. 30–Oct. 5, American Social Hygiene Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Conference of State Laboratory Directors, Minneapolis, Minn.

Sept. 30–week, National Safety Council, Chicago, Ill.

Oct. 14–18, American College of Surgeons, Chicago, Ill.

Oct. 21–25, Inter-State Postgraduate Medical Association of North America, Detroit, Mich.

Oct. 24–26, International Association of Milk Dealers, Toronto, Can.

Nov. 4–7, 8th Annual Meeting of the American College of Therapy, Chicago, Ill.

Nov. 11–13, National Society for the Prevention of Blindness, St. Louis, Mo.

Nov. 20–22, Southern Medical Association, Miami, Fla.

FOREIGN

Oct. 16, International Conference for the Revision of International Classification of Causes of Sickness and Death, Paris, France.

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